NETWORK WORLD

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IBM primps OS/2 EE on eve of debut

By Mary Petrosky
West Coast Bureau Chief

AUSTIN, Texas — IBM this month began shipping the Extended Edition of its OS/2 operating system, which promises to expand dramatically the role of personal computers in IBM's networking architecture.

IBM has stressed the terminal-emulation feature and other communications attributes of OS/2 Extended Edition, as well as its built-in data base management capabilities and compatibility with IBM's Systems Application Architecture.

But many would-be users are focusing solely on its local networking abilities, which will not be supported until Version 1.1 of the operating system ships in November. OS/2 Extended Edition was developed by IBM's Entry Systems Division, based here.

In IBM mainframe shops, data processing managers have shown interest in Extended Edition because of its host connectivity features, noted Mark Freund, vice-president and cofounder of Interconnect Network Consulting Group in Pasadena, Calif.

However, those who manage local nets are less enthusiastic,

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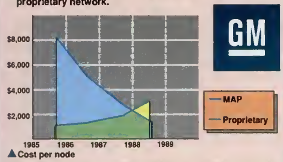
Mapping MAP costs

Total communications cost per node: MAP network vs. proprietary network.



▲ Cost per node

GRAPHIC BY SUSAN SLATER SOURCE: GENERAL MOTORS CORP., WARREN, MICH

MAP research center puts GM on road to the future

Test labs, training facilities help GM managers realize benefits of factory networking standard.

By Barton Crockett
Senior Writer

WARREN, Mich. — A group of MAP laboratories and training centers, housed in General Motors Corp.'s sprawling Technical Center here, is playing a vital role in the automaker's efforts to cut costs and boost lagging sales.

These facilities are the nerve center of GM's Corporate MAP Program. Led by Manufacturing Automation Protocol pioneer Michael Kaminski, 37 engineers coordinate three MAP test laboratories, conduct semiannual MAP symposiums and manage an internal MAP education program.

The center is a mecca for hundreds of GM factory managers. They trek here to see MAP networks and products in operation and to learn how MAP can improve their division's profit margins.

Once here, they work with equipment most users have only read about. For example, GM's MAP demonstration booth at the Enterprise Networking Event '88 International (ENE '88) has been moved here, and it will soon be used, among other applications,

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AT&T reveals plans to offer EDI service

User demand spurs development of document exchange offering that works with E-mail net.

By Jim Brown
New Products Editor

NEW YORK — AT&T acknowledged last week it plans to announce this fall an electronic data interchange (EDI) service that will be offered over its AT&T Mail public electronic mail network.

AT&T is entering the EDI market in response to AT&T Mail customers who are committed to EDI or are experimenting with its use, said Gary Dalton, AT&T's EDI offer manager. In fact, AT&T's support may help spur acceptance and use of EDI, according to analysts.

EDI enables companies to electronically exchange documents such as purchase orders, bills of lading and invoices with trading partners. Electronic exchange of such documents helps businesses speed order and payment processing, cut costs and realize strategic benefits over competitors.

AT&T is now using the service to exchange EDI documents with its own suppliers, Dalton said. The company plans a controlled introduction of the service later this year, with general availability during the first half of 1989.

Initially, the service will support the exchange of EDI documents formatted according to the ANSI X12 EDI standard, which defines document data elements.

Dalton said AT&T will later support EDI standards developed and used by specific vertical industries, such as the pharmaceutical and grocery industries.

Customers' X12 or other type of EDI documents will be encapsulated for transmission in packets conforming to AT&T's Unified Messaging Architecture (UMA).

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Microwave net to slash bank's costs

By Bob Brown
Staff Writer

BALTIMORE — The First National Bank of Maryland recently cut over the first leg of a $4 million private microwave network that will eventually span 266 miles and cross the Chesapeake Bay twice.

The network, called "Freedom Net," is expected to pay for itself in three years by reducing the bank's reliance on AT&T T-1 facilities. It also promises to provide a strategic advantage by slashing the cost of delivering services to customers, according to bank officials.

"Reduction in the cost of delivering services allows us to price our services more competitively and increase profitability," said bank President and Chief Executive Officer Charles Cole.

The bank, the second-largest commercial institution in the state, has 4,000 employees, 145 branch offices and, as of last year, roughly $5.6 billion in assets.

All branches will be supported by the integrated voice/data network, which will eventually consist of three interconnected digital microwave backbones supported by 14 radio sites. Most of the radios operate at 6 GHz with a 45M bit/sec capacity, but two short spans will be supported

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WHEN IBM UNWRAPS its 16M bit/sec Token-Ring, it will also unveil a graphics-driven console for NetView and an enhanced controller. Page 2.

INLAND STEEL COMPLETES the cutover to a Centrex network supported by a Northern Telecom Large Business Remote switching unit. Page 2.

3COM TELLS ANALYSTS it will offer entry-level and advanced versions of its 3+Open, based on Microsoft's OS/2 LAN Manager. Page 3.

MICOM MULLS OVER an acquisition proposal and waits to see what other suitors may have to offer. Page 3.

INSURANCE FIRM CIGNA hopes to boost insurance sales by giving independent agents access to its SNA net. Page 6.

IS THE "NEW SNA" all it's cracked up to be? Page 36.

NEWSPAPER

FEATURE

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Small switches with big features face full market

Small and hybrid PBXs sport new features, but few vendors offer ISDN capability yet.

By John Hunter
Contributing Editor

Telecom
BUYER'S GUIDE

Today's small private branch exchanges may be limited in the number of trunks and lines they can accommodate, but certainly not in features. Like their big brothers — the midsize and large PBXs — the junior members of the family support full-featured telephones, queuing to busy resources, high station-to-PBX data transfer rates, automatic call distribution, voice messaging and now, or in the near future, Integrated Services Digital Network support. In addition, the market may be in for a round or two of price-cutting that will shake out the weaker competitors in the business.

Hybrids and small PBXs are very similar when it comes to functionality. The principal difference is that hybrids typically work with key sets, while PBXs use full-featured telephones. Both work with Centrex.

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IBM readies key network offerings for fall debut

Graphics-driven operator console for NetView, upgraded terminal controller among products.

By Laura DiDio
Senior Editor

IBM will roll out a graphics-driven operator console for NetView and an upgraded terminal controller when it introduces its 16M bit/sec Token-Ring Network this fall, according to consultants briefed by the company.

Details about the NetView workstation and the controller — an IBM 3174 Cluster Controller enhanced to support the 16M bit/sec Token-Ring — originally started to leak out at a consultants' briefing in Raleigh, N.C., last spring.

The operator console, called the Integrated Workstation (IWS), will adhere to IBM's Presentation Manager standards, a facility that is also part of IBM's Systems Application Architecture (SAA), sources said.

At the briefing, IBM said the NetView workstation will offer a standard interface to all IBM network management functions. IBM officials further "hinted that the new IWS console may even provide an interface to network management functions on mid-range systems and LANs, as well as host systems," said James Herman, an independent consultant based in Cambridge, Mass.

"It wasn't clear in the briefing whether or not the graphics workstation has to be locally attached or whether it can be located anywhere on the network," Herman said.

The graphics-driven operator console, the consultants concurred, is a must for IBM since other vendors are already marketing such products.

"IBM has caught a lot of flack for not having a graphics interface to their own network management capabilities. From a marketing standpoint, it makes NetView look like an old rather than a new technology," Herman said.

The graphics interface, which is said to use icons, is expected to make NetView easier to use by doing away with the command line orientation currently employed. It lets users see relationships between objects in the networks and their conditions, the analysts reported.

IBM has had to hold off on the introduction of a graphics interface to NetView until the Extended Edition version of OS/2 was available, according to David Passmore, a principal at Network Strategies, Inc. (NSI), an end-user consulting firm in Fairfax, Va. OS/2 Extended Edition incorporates the Presentation Manager.

George Colony, president of Cambridge, Mass.-based Forres-

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First user of Northern Tel LBR completes net cutover

Inland Steel goes Centrex with DMS-100 unit.

By Rex Bowman
West Coast Correspondent

HARBOR WORKS, Ind. — Inland Steel Co. recently linked the last of its telephones to a Northern Telecom, Inc. Large Business Remote (LBR) at its 2,000-acre complex here, becoming the first user to get Centrex service through an LBR.

Inland dumped its private branch exchange to use the LBR, a remote switch unit housed on the user site that works with Northern Telecom's DMS-100 central office switch. Inland has already started to save some $40,000 a month using the LBR in place of the one Western Electric Co. 701 electromechanical PBX that previously supported all its telephones.

A large part of that savings comes from cutting the cost of supporting approximately 400 telephones at four remote sites.

Inland's LBR, capable of supporting up to 30,000 lines, sits in the North Annex building at Inland's complex here. It is connected to roughly 5,100 on-premises telephones.

In addition, another 400 telephones are linked to the LBR at four off-site facilities: research, personnel, insurance and the credit union.

Attached via a fiber link to a DMS-100 in Indiana Bell Telephone Co.'s East Chicago central office, the LBR handles all on-premises switching without help from the DMS-100. For example, a call from a delivery dock to a nearby corporate office at Harbor Works would be routed directly through the LBR, with no assistance from the DMS-100.

All off-premises calls are routed to the DMS-100 over the fiber link. For instance, a call from the production line to a company in Atlanta would travel over standard phone wire to the LBR, from there over the fiber link to the DMS-100 and out over the public switching network.

Telephone lines running from two of the remote facilities are

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Briefs

MCI in Big Blue buyback. MCI Communications Corp. last week agreed to buy back over the next three weeks some 47 million shares of its common stock owned by IBM at a cost of $677 million. The shares, which represent a 16% stake in MCI, were acquired by IBM in March of 1986 as part of its sale of Satellite Business Systems to MCI.

The timing of the stock buyback surprised analysts, who had expected that MCI would repurchase the shares over a two- to five-year period. They said the buyback is a sign of MCI's confidence in its financial position.

In a separate transaction, IBM said it would buy two million newly issued shares of MCI preferred stock for $400 million. The stock will pay a dividend of 7.35%. The companies said the purchase supersedes an earlier agreement under which MCI, to raise capital, could sell IBM up to $400 million in convertible preferred stock or debentures.

WATS more. MCI Communications Corp. last week announced a WATS-like service that allows customers in California to transmit intrastate, interstate and international direct-dial calls to 146 countries over a single line.

The new offering, called Cal Prism, is designed to compete with AT&T's Full-State WATS service. Full-State WATS customers can purchase a single line to complete all intrastate calls but, unlike Cal Prism users, they cannot complete interstate and international calls, MCI said. The service features distance-sensitive pricing competitive with AT&T's service, and MCI is waiving the $50 order fee, $150 installation fee and $35 per-line monthly fee through the end of the year. Cal Prism will be available Aug. 1.

SW Bell Telecom in ISDN pact. Southwestern Bell Telecom in Houston, a wholly owned subsidiary of Southwestern Bell Corp., has signed a contract to supply Integrated Services Digital Network terminal equipment to Shell Oil Co.'s Houston headquarters. The deal with Shell calls for the carrier to supply roughly 1,000 ISDN stations to Shell. The equipment includes both voice-only telephones and voice/data-capable telephones with built-in RS-232 jacks for connecting personal computers.

Apple names networking exec. Underscoring its commitment to the networking market, Apple Computer, Inc. last week named former IBM executive Donald Casey to the post of vice-president of networking and communications. In his new position, Casey will direct all of Apple's data communications research, development and product marketing efforts. He will report to Jean-Louis Gasse, the company's senior vice-president of research, development and product marketing. Casey worked at IBM for 21 years and most recently served as vice-president of communications hardware development in IBM's Communication Products Division in Raleigh, N.C.

Fujitsu joins X/Open. Fujitsu Ltd., Japan's largest computer manufacturer, is the latest firm to join the ranks of the X/Open consortium. The consortium, which now has 14 member companies, is working to develop a common applications environment based on international standards.

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Micom Systems mulling buyout bid from NY firms

Investment firms offer $292 million to acquire data communications equipment manufacturer.

By Bob Brown
Staff Writer

SIMI VALLEY, Calif. — Micom Systems, Inc., a maker of data communications equipment, last week said that two New York investment firms offered to jointly acquire the company for about $292 million.

The company added that, while mulling over the offer from Welsh, Carson, Anderson & Stowe IV and Warburg, Pincus Capital Co., it will continue to weigh and solicit offers from other parties.

In April, Micom Systems announced that it was reviewing acquisition proposals from a number of unspecified suitors ("Micom gets hit with wave of takeover proposals," *NW*, May 2). Those proposals were spurred by the company's plan to buy back about nine million of its shares, in part to resolve a split between major shareholders and members of the company's board of directors. Outside companies figured that if big shareholders were willing to sell, then the rest of the company also might be in a selling mood, analysts said.

Under the terms of the first formal offer Micom Systems received, the investment companies would pay holders of the company's 18.7 million outstanding shares $15.62 a share if two key Micom Systems units are sold prior to the deal.

If the units — Micom-Interlan, Inc. of Boxborough, Mass., and Micom Digital Corp. of Herndon, Va. — are not sold before the proposed deal, holders would get $12 a share. They would also receive notes entitling them to a portion of the proceeds when the units are sold at a later date.

According to Micom Systems, there are currently no arrangements for the sale of the two units. The company's board of directors has until July 20 to respond to the buyout proposal.

Neither investment firm was available for comment.

Micom Systems makes local network products through Micom-Interlan, while Micom Digital sells high-end T-1 multiplexers. The company is also known for its mail-order catalog subsidiary, Black Box Corp., which sells low-end data communications hardware and software.

The company confirmed that it is willing to sell off separate units.

Analysts were not surprised by the proposal, but stock analyst Robert Wilkes of the investment firm Brown Brothers Harriman & Co. in New York said that he would be surprised if Micom Systems accepts the deal.

"For one thing, the offer probably came earlier than the company expected," Wilkes said. "But this could pressure some other companies to make offers soon." Wilkes added that the offer was a little less than he thought it would be and that the eventual buyer probably will have to pay more than $15.62 share.

When Micom Systems announced earlier that it had received offers, most analysts said a computer or communications company would buy the vendor.

Even if the investment firms' offer is accepted, communications companies could end up owning parts of Micom Systems, Wilkes said.

Micom Systems pulled in $223 million in revenue last year, including about $31 million from Micom-Interlan and about $5 million from Micom Digital.

Wang announces TCP/IP net software for VS minis

By Paul Desmond
Staff Writer

LOWELL, Mass. — Wang Laboratories, Inc. last week responded to the needs of some of its largest customers by introducing software that will enable its VS minicomputers to support the Transmission Control Protocol/Internet Protocol.

The Wang VS TCP Interconnect enables Wang minicomputers to support electronic mail and file transfer, as well as remote log on to non-Wang hosts tied together on a TCP/IP-based local network.

Kay Fairweather, senior marketing manager for network products at Wang, said the firm developed the software as a requirement of its largest contract — the $480 million, five-year U.S. Air Force Minicomputer Multi-User System project — which Wang won in 1986.

Wang also has large accounts with defense contractors and major universities, both of which use equipment from several different vendors and rely heavily on TCP/IP, she said.

Wang VS TCP Interconnect supports three TCP/IP applications.

Telnet is a virtual terminal application that allows Wang VS workstation users to log on to other vendors' systems, including IBM and Digital Equipment Corp. processors. File Transfer Protocol supports text and data file transfer between Wang and non-Wang systems, even while users have full use of their workstations.

The third application, Simple Mail Transfer Protocol (SMTP), allows different vendors' systems to exchange E-mail over a TCP/IP network. It also supports the exchange of Wang Word Processing and Wang WP Plus documents between Wang Office and SMTP users on non-Wang systems. Wang Office is Wang's integrated office application suite.

> Wang developed the software as a requirement of its largest contract — the U.S. Air Force Minicomputer Multi-User System.
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Fairweather said the product allows VS systems to simultaneously support Wang Systems Networking (WSN), Open Systems Interconnection and TCP/IP protocols without additional hardware or software. Other vendors, she said, require dedicated physical links for each protocol.

Although the new software makes Wang compatible with TCP/IP, Fairweather stressed the move should not be seen as a shift away from the Office environment. She noted that the SMTP portion uses Office as the user interface. Rather than shift away from Office, the product allows Office users to communicate with equipment from other vendors by using TCP/IP.

"There are a lot of folks out there who will, in fact, be using TCP/IP for a number of years," Fairweather said. "We want our systems to be much more open and to support multivendor environments."

Fairweather said the VS TCP Interconnect is an important step in this long-term strategy of multivendor integration. "OSI today, in 1988, is not enough because it's not widely used yet," she said. Likewise, the IBM protocols, while important, are not enough to provide multivendor integration, she said.

Lee Doyle, a senior analyst with International Data Corp., a research firm in Framingham, Mass., said that while Wang is one of the last major vendors to support TCP/IP, the move appeared to be part of Wang's overall strategy to support a large number of de facto standards.

But Doyle does not expect the product to sell particularly well. "It's not really an impact product

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3Com to offer entry-level, advanced 3+Open options

Networking ware based on OS/2 LAN Manager.

By Mary Petrosky
West Coast Bureau Chief

SANTA CLARA, Calif. — 3Com Corp. announced last week it will offer both entry-level and advanced versions of 3+Open, which is expected to be one of the first available local network products based on Microsoft Corp.'s OS/2 LAN Manager.

3Com executives detailed pricing and features of the new products, slated to ship in October, and discussed future 3+Open enhancements during a meeting with financial analysts at the company's headquarters here. At the meeting, William Krause, 3Com's chairman and chief executive officer, said the company aims to become the first $1 billion networking vendor.

3Com is targeting the $995 3+Open LAN Manager Entry System at users of small, stand-alone local networks. In contrast, the $2,995 3+Open LAN Manager Advanced System is geared to large companies that want to link multiple networks. The company began beta-testing both products last month and expects to have the software installed for testing at 40 customer sites worldwide by the end of July.

Both the Entry and Advanced System products are based on OS/2 LAN Manager, which 3Com codeveloped with Microsoft. Both support the Network Basic I/O System interface and the Named Pipes mechanism for communications across programs or tasks. As a result, both will run the same applications. The two systems will support personal computers running either MS-DOS or OS/2.

However, the Advanced System will support many more capabilities than the Entry System. Because the Entry System is designed for five or fewer users on a stand-alone network, it will not support the internetworking and local network-to-host communications supported by the Advanced System.

3Com also expects to offer simplified network setup and management facilities for the Entry System.

The Advanced System is designed for large networks and the interconnection of local networks. It will support an unlimited number of users per server and multiple servers per local network. It will also accommodate a variety of networking protocols, including Xerox Network Systems, IBM's Data Link Control and the Transmission Control Protocol/Internet Protocol.

3Com's goal is to make its products protocol-independent, according to Eric Benhamou, vice-president and general manager of the Software Products Division.

The Advanced System version of 3+Open is compatible with 3Com's line of workstations and network management workstations, terminal emulation and personal computer-to-host communications products, bridges and gateways, communications servers, and network adapters. Company officials also said 3+Open is compatible with 3+, 3Com's current MS-DOS-based networking software.

In addition to the two versions of its new networking software, 3Com plans to offer 3+Open LAN Manager configured for the company's 3S/400 dedicated network servers.

Also due for delivery in October, this $3,495 package includes the Intel Corp. 80386 microprocessor-based 3S/400 server, server software, tape backup and software that allows MS-DOS-based workstations to boot from the server.

> 3Com's goal is to make its products protocol-independent, said Eric Benhamou of the Software Products Division.
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Throughout the analysts' meeting, 3Com executives repeatedly said that the company's focus is on providing networking systems to large corporations, as opposed to simply providing networking components or personal computer local network products.

In addition, executives explained that the Bridge Division was recently renamed the Enterprise Systems Division as a sign that the merger with Bridge Communications, Inc. is complete and that the two companies' product lines have been integrated.

Company executives also disclosed a number of planned 3+Open enhancements designed to meet the needs of large network users. Directory services and additional routing capabilities will be added to the 3+Open product line in the first half of 1989, according to Benhamou.

In addition, the company will be investing in the development of a global distributed naming service, as well as a network management architecture, Benhamou said. 3Com's network management products will be delivered in phases through 1990. The company also expects to provide support for IBM's NetView by the end of this year.

PUCs unite to keep tabs on RBHCs

By Rex Bowman
West Coast Correspondent

CHICAGO — Public utility commissions (PUC) are beginning to move beyond state boundaries by forming regional committees to monitor the overall deregulatory strategies of the regional Bell holding companies.

Recently, utility commissioners in Ameritech's five-state territory formed the Ameritech Regional Regulatory Committee (ARRC). The move came one year after all 14 PUCs in US West, Inc.'s territory united to form the Regional Oversight Committee (ROC).

Both groups say their purpose is to improve relations with the RBHC serving their region, allow for the exchange of information between PUCs in different states and provide a forum for discussion of common issues. Overall, the groups feel they will be able to deal more effectively — compared to an individual PUC — with the powerful carriers. The PUCs located in Ameritech's and US West's territories characterized the carriers as aggressive seekers of deregulation. Thus, the regional groups will help them better address that issue as well.

"Rather than attack the issues piecemeal within each border, we figured we should get together," said Kim Ambler.

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"Rather than attack the issues piecemeal within each border, we figured we should get together to share information," said Kim Ambler, a telecommunications coordinator for the Western Conference of Public Service Commissioners (WCPSC) and an aide to the ROC. "It was something that grew out of a great deal of confusion about what [the RBHCs'] policies are and how they try to implement them. The ROC is the antidote to that confusion."

Or, as Ron Binz, director of the Colorado Office of Consumer Counsel, put it, "Getting US West in one place and having everybody hear the same story at the same time will help."

Although neither of the committees has regulatory control over the regional Bells, both US West Communications, Inc. (formerly known as Mountain Bell, Northwestern Bell Telephone Co. and Pacific Northwest Bell) and Ameritech have begun to work with the groups.

US West Communications, however, has not yet identified the ROC as friend or foe. "Our attitude is going to depend on the function" of the ROC, said spokewoman Debbie Thomas. "If the ROC is going to be another layer of regulation, then we're not going to support it. If indeed its purpose is to get people together to find solutions and have an open idea forum, then we can support it."

Since its inception in March 1987, the ROC has held three meetings, at which US West representatives explained the RBHC's policies. US West participation has increased with each meeting, Ambler said.

One example of an issue common to all states within US West's territory is the company's recent decision to incorporate its three Bell operating companies into one larger entity: US West Communications. The PUCs are worried that each state will receive less individualized treatment from US West.

The members plan to discuss the issue with US West when the commissioners on the ROC meet with the carrier this September.

Ameritech, meanwhile, seems to have adjusted well to the newly formed ARRC. "It's not adversarial at all," said Harry Kalajian, senior vice-president of governmental affairs for Ameritech. "We have a good relationship. We've met and talked about things in a very general way and [Ameritech's five Bell] companies will continue to meet with them."

Thomas Saghy, a staff member of the Michigan PUC, agreed with Kalajian's assessment of the relationship. "I don't think Ameritech would recommend that other PUCs set up committees," Saghy said. "But there's a committee in their region and they've decided to work with it."

The ARRC is more informal than the ROC, with many meetings taking place through conference calls. One commissioner and one staff member from PUCs in each of the five states in Ameritech's territory make up the committee. The ROC has almost 40 members.

Saghy cited information sharing as a key benefit of forming an interstate PUC committee. "We get more than just the Michigan view," Saghy said. "We get to find out if similar things are going on in the other states, and we get to find out how things are orchestrated."

The National Association of Regulatory Utility Commissioners and the WCPSC have both encouraged the formation of such regional committees.

"It's a good idea," said Colorado's Binz. "It makes sense for regulators to ignore geographic boundaries and get together to look at this big organization that operates in all their states."

Consumer group, others add fuel to price caps fire

FCC productivity figure at heart of controversy.

By Anita Taff
Senior Correspondent, Washington

WASHINGTON, D.C. — Adding fuel to the debate over price cap regulation, a leading consumer organization said last week that price caps could cost users billions of dollars more than current rate-of-return regulation.

In a letter to Rep. Edward Markey (D-Mass.), chairman of the House Telecommunications and Finance Subcommittee, the Consumer Federation of America (CFA) claimed that if price cap regulation had been in effect during the last decade, telephone ratepayers would have paid $7 billion more for interstate services.

Dennis Patrick, chairman of the Federal Communications Commission, has estimated that price caps could save consumers $1.6 billion over current regulation during the first four years of implementation.

Much of the argument over how consumers will fare under the proposed plan centers on a formula devised by the FCC to determine the level at which prices should be capped. The commission has proposed that carriers must cap their rates at 3% less than the gross national product index (GNPI), which measures the productivity of the U.S. economy as a whole. This 3% productivity factor is designed to let users share in the benefits of increased network productivity.

However, the 3% productivity factor has come under fire from a number of groups. During a subcommittee hearing on price caps last week, Markey described the productivity index issue as "the key to price caps" and expressed concern that the FCC was relying too heavily on untested assumptions in its determination of productivity levels of carriers.

The FCC has proposed that carriers must cap their rates at 3% less than the GNPI.

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Markey said he had received a letter from Janet Norwood, commissioner of the Bureau of Labor Statistics (BLS), saying that agency had been unable to formulate an adequate productivity index for the telecommunications industry.

The bureau began preliminary work on such an index but found that cost data was either not available or reported in such a way that analysts were unable to determine accurate productivity levels, according to Lisa Usher, an economist with the BLS. The bureau has never issued a productivity index for a nonmanufacturing industry such as telecommunications, she said.

The FCC is going outside its area of expertise on the productivity issue, Markey said, adding, "We can't have billions of dollars being transferred [between carriers and consumers] on the basis of deduction or assumption."

Patrick, who testified at the subcommittee hearing, admitted that in some cases data was lacking and the FCC had made assumptions in determining productivity levels. However, he said that current rate-of-return regulation also requires assumptions to be made about the likely costs of providing service in the future.

Gene Kimmelman, legislative director for CFA, said that, based on the same data the FCC used, his group estimated that price caps 6% below the GNPI would more accurately reflect the increased productivity of carriers. In an earlier filing with the FCC, the International Communications Association (ICA) said caps should be 5% below the GNPI.

Page Montgomery, vice-president of Boston-based Economics and Technology, Inc. and author of the ICA report, said that for every half a percentage point the FCC underestimates carrier productivity, users will be charged $250,000,000 more per year for services under price caps.

AT&T reveals EDI service plan

continued from page 1

UMA, which is largely based on CCITT X.400 E-mail interchange standards, defines how documents are routed through the AT&T Mail network.

Encapsulation can take place at the user site, or it can be provided as a service from an AT&T Mail service point.

EDI software vendors Tran-Settlements, Inc. and Supply Tech, Inc. will provide mainframe and microcomputer-based software supporting UMA under agreements signed with AT&T. Optionally, users will be able to purchase UMA software modules from AT&T that can be integrated into existing EDI software.

With UMA, trading partners will be able to use a single AT&T Mail network link to exchange E-mail and EDI documents.

Customers access AT&T Mail by using toll-free 800 numbers to dial into the service to leave or retrieve messages. By this fall, customers will also be able to use private lines and AT&T's Accunet Packet Service to access the AT&T Mail network.

AT&T's market entry will add legitimacy to the use of EDI and spur industry competition, said Mark Winther, vice-president of telecommunications research for Link Resources, Inc., a market research firm in New York.

Increased competition will likely drive down service costs, according to Jack Shaw, president of EDI Strategies, Inc., a Marietta, Ga.-based firm that publishes EDI newsletters and helps customers build EDI networks.

"I expect we'll see AT&T moving very quickly and becoming a strong competitor in the marketplace," Shaw said. "The more competition we get in the market, the better it is for everybody."

Winther thinks otherwise. He said the EDI market is only about $50 million a year, and it is unlikely AT&T's entry will spur a pricing war. The business challenge, he said, is not in stealing market share from other EDI network vendors, it's in trying to convince new users of EDI's viability.

The competition

The service, to be marketed by AT&T's Business Market Group, Data Systems Group and Federal Systems Division, will pit AT&T against such EDI network operators as GE Information Services, which offers EDI*Express; McDonnell Douglas Information Systems Group, which operates EDI-Net; and Sterling Software, Inc., which offers Ordernet Services.

Dalton said AT&T will also offer X.400-based gateway services to enable users of its AT&T Mail network to exchange documents with users linked to other EDI nets.

Unlike other EDI network providers, AT&T does not intend to double-charge customers for providing internetwork services, according to Dalton.

Typically, companies supported by the same EDI network split the network transport charges, the cost of originating and later delivering the document. Double charging occurs when the senders and receivers are supported by different EDI carriers and each is billed for the originating and delivery charges.

Options that AT&T is considering to avert double charging, Dalton said, include charging senders and receivers half the full cost of internetwork traffic plus a slight gateway surcharge or providing the gateway service free of charge.

The introduction of EDI services will mark AT&T's second crack at the market. The company first attempted to offer EDI service over the now defunct Net 1000, which was withdrawn from the market in 1986.

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Insurance firm plans to give agents access to net

Delphi Systems' automation systems will let agents get price quotes, make inquiries on-line.

By Paul Desmond
Staff Writer

PHILADELPHIA — In an effort to increase business from independent insurance agents, a division of Cigna Corp. has entered into a $40 million project to provide agents with hardware and software that let them access Cigna's network.

The Insurance Company of North America, a Cigna subsidiary based here, will work with Delphi Systems, Inc. of Westlake Village, Calif., to market Delphi's Automated Insurance Management System (AIMS), a so-called agency automation system, to independent agents who write policies for the $3 billion Agency Division of Cigna's Property and Casualty Group. The companies expect to sell at least $40 million worth of AIMS systems over the next five years.

The systems will provide office automation capabilities and allow agents to access Cigna's mainframes over its IBM Systems Network Architecture network to write and cancel policies, get price quotes and make inquiries.

Cigna, which will offer financing for the systems, is hoping that, by making it easier for agents to work with the company, they will sell more Cigna policies.

Cigna will even offer a plan, called "Financing Forgiveness," under which agents that commit to selling a certain number of Cigna policies will not have to pay Cigna for the Delphi system, said William Beaumont, a Cigna vice-president. He would not detail how much an agent would have to sell to get the system at no cost.

In addition to allowing access to Cigna, the Delphi system will allow agents to access any of the other 15 independent insurance carriers that have agreements with Delphi, said Michael McConnell, chief financial officer for Delphi.

This link may be either direct to the carrier or through the Insurance Value Added Network Service Corp. (IVANS), a nationwide net that links many insurance carriers and agents. Agents must be authorized by a given carrier to access its network, McConnell said.

This electronic exchange of data, Beaumont said, takes much of the paperwork out of the policy-writing process. In the past, data was exchanged through the mail or by courier, a costly and time-consuming process, he said.

"There's always a percentage of your agents who don't want automation and won't deal with it."

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"Electronic distribution changes the service standards from what was measured by a calendar to what can now be measured by a clock," he said.

Agents who buy the Delphi system get an IBM RT Personal Computer Model 125 processor with software that allows them to access Cigna's network.

Cigna uses IBM Model 3090 mainframes, Model 3725 front-end processors and Model 3274 cluster controllers in an SNA network that covers the 49 continental states, said Edward Driscol, Cigna's director of agency automation services.

Sites currently supported by the net, dubbed TED for Total Electronic Distribution, are linked using mostly 9.6K bit/sec dedicated lines with some 56K bit/sec and T-1 lines at high-volume locations, Driscol said. Independent agents have the option of linking to TED using either dedicated or dial-up lines or through IVANS.

Beaumont expects about 80% of the 3,200 independent agents selling Cigna insurance will buy the Delphi system, whereas right now about 50% of those agents can interface with TED. "There's always a percentage of your producer force [agents] who don't want automation and won't deal with it," Beaumont said. "But the overwhelming majority will be interfaced."

Beginning next year, the agency automation system is expected to support a single-entry feature. Agents will key in information for a new policy that must be processed by Cigna. That information will then be downloaded nightly to the agent's data base, eliminating the need for agents to key the data into data bases.

Beaumont said Delphi's system will be the first in the insurance business to allow for single entry of policy data for both personal and commercial lines of business.

This feature is currently being beta tested at a California agency and will be available early next year, he said. The beta user could not be reached for comment.

Single entry is important for agents since it may take them 30 minutes to enter the information needed for each new policy. Eliminating the need for agents to enter this information twice increases productivity and efficiency, thereby increasing revenue for the agent and Cigna, Beaumont said.

Companies including Aetna Life & Casualty Co. of Hartford, Conn., and SAFECO Corp. of Seattle currently use single entry for personal lines of business, such as home-owner and personal automobile insurance, but not for commercial insurance, Beaumont said.

Michael McLaughlin, senior vice-president of information systems and services for New York-based New York Life Insurance Co., said that while Cigna may be first with single-entry technology, others are not far behind. "I suspect that a whole bunch of other people are looking at the same kind of capability as it relates to our specific business," he said. New York Life is currently looking into a system that will allow agents to input policy data directly to a mainframe from a lap-top personal computer at the point of sale, he added.

Cigna will help Delphi sell its systems by offering financing to the 3,200 independent agents who currently sell Cigna insurance, a practice Beaumont said is common in the insurance industry. New York-based Continental Insurance Co., for example, has been offering selected agents IBM System/36s free of charge since 1986.

Delphi, which remarkets IBM products, will sell the independent agents all necessary hardware and software, install the systems, train users and service the equipment, McConnell said.

In its deal with Delphi, Beaumont said, Cigna received the option to purchase up to 11% of Delphi stock at a fixed rate of $7.50 per share.

AT&T preps T-1 monitor capability

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week said it plans to market a T-1 service option in the second quarter of next year that will extend T-1 monitoring capabilities to its Accunet T1.5 Service users.

The as yet unnamed option is designed for users who want T-1 performance data but do not need the sophisticated capabilities of AT&T's Bandwidth Management Service (BMS).

The new feature will enable a user equipped with an MS-DOS-based personal computer or compatible to receive T-1 performance data transmitted across a 9.6K bit/sec private line from AT&T computers located in each of AT&T's central office switch sites.

The information will include T-1 alarm conditions as well as data concerning line quality and equipment performance collected by the extended superframe format AT&T uses on its T-1 facilities.

Customers can display this T-1 information or view a model of their T-1 network on the workstation. AT&T would not detail the personal computer configuration needed to support the option.

"The feature will give the user the T-1 information needed to perform fault management," explained Yvonne Hodge, product manager for AT&T's Accunet T1.5 Service.

Technical specifications

AT&T last week released technical specifications that describe the interface, service features, network architecture and customer equipment that will be needed to use the option. Customer premises equipment vendors can use the specifications to build equipment compatible with the feature.

"Many of our customers explained that they wanted the ability to receive alarm status and other performance information so they could monitor the operation of their T-1s," Hodge said.

She added, however, that many of these T-1 users did not really need many of BMS' advanced features.

BMS, an option available with Accunet T1.5 Service, enables customers to use an on-premises terminal to reconfigure channels within T-1 trunks in as little as one minute.

AT&T said it will provide the technical information on the option to manufacturers of customer premises equipment who write on company stationery to Mike Brunhofer, AT&T, Room 5358C1, 295 N. Maple St., Basking Ridge, N.J. 07920.

First LBR user completes cutover

continued from page 2

bundled into cables connected directly to the LBR. Calls from the other two remote locations travel a different path. Telephone lines from those two sites are bundled into cables running into the East Chicago central office. From there, they run to the DMS-100 and from there to the LBR.

"The LBR is really a small central office on our premises," said James Reddel, product manager in charge of hardware selection decisions for Inland. "It gives us features comparable to a PBX, but it's in a central office-type environment, and Indiana Bell is responsible for maintenance."

Indiana Bell installed the LBR on Inland's premises to replace the PBX Inland had been using since 1969, according to Reddel.

Inland decided to use Centrex service early last year because maintaining the old PBX was becoming too expensive and the price of linking the off-site facilities to the PBX was escalating, Reddel said.

"We had off-premises extension lines running to every single telephone off-site," he said. "Each one of those lines was a billable item."

The options

Indiana Bell presented two possible solutions: a PBX-based network or LBR-supported Centrex service. Inland picked the LBR solution because of the creative pricing plan Indiana Bell offered, Reddel said.

Bruce Fleck, Indiana Bell manager for customer conversions, said customer-specific tariffing made the LBR attractive to Inland.

"For very large Centrex customers, we are able to put together a customer-specific tariff offering," Fleck said. "And the Indiana Public Service Commission approved the offering. There was no way we could compete with [other vendors] without that customer-specific tariffing."

Neither Fleck nor Reddel would reveal how much money Inland is paying to use the LBR.

Several months ago, Indiana Bell announced it would install another LBR on the campus of Indiana University in Bloomington. That LBR, to be cut over next year, will tie together more than 250 buildings and support 18,000 lines on the university's campus.

Indiana University's LBR will be used primarily to tie together telephones in dormitory rooms.

Reddel said he is pleased that Inland has control over the Centrex service. A terminal connected to the LBR lets an Inland network administrator monitor the network continually, as well as do call route selection and uniform call distribution. "We can also make our own moves and changes," Reddel said.

Cost savings

The major benefit of the move to the LBR, though, is the cost savings. According to Reddel, $15,000 of the company's monthly savings comes from no longer having to pay Indiana Bell for use of the lines that connected the 400 telephones at four remote sites to a PBX located here.

Other savings come from eliminating PBX maintenance costs and the LBR's automatic route selection features, which cut down on long-distance expenditures. Also, Inland previously employed eight operators to handle call traffic. It currently only needs six.

"Now that the system's installed," Reddel said, "we're saving money. And that starts now."

Service providers look to transit authorities to rent rights-of-way

By Bob Wallace
Senior Editor

Long-distance carriers, bypass network providers and resellers are turning to metropolitan transportation authorities for the rights-of-way they need to extend their networks into major metropolitan areas.

Transportation associations in Boston, Washington, D.C. and Philadelphia are leasing rights-of-way along trolley and commuter rail lines to service providers and are using these revenues to improve their own telecommunications networks.

In Boston, eight different companies have lined up to lease rights-of-way from the Massachusetts Bay Transportation Authority (MBTA), including MCI Communications Corp., bypass network operator Teleport Communications-Boston and American Private Lines, Inc., a regional reseller of long-distance services. New England Telephone and Telegraph Co. is not among the group.

Last March, the Washington Metropolitan Area Transportation Authority (WMATA) leased rights-of-way to Institutional Communications Co. (ICC), a Bethesda, Md.-based bypasser.

Like the MBTA, WMATA required its first customer — ICC — to install dark fiber for WMATA use.

> ‘‘We didn't realize we had something valuable to lease until we were approached by several parties,'' said Mary Goldberg, market planning specialist for Boston's MBTA.
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"We wanted the fiber, but we didn't want to spend our time and resources installing it," explained Wesley McGaughry, a member of WMATA's finance department. "We knew we were asking a lot of ICC, but they agreed."

McGaughry said WMATA is discussing right-of-way leases with MCI and the Chesapeake & Potomac Telephone Co. "We're leaving the door wide open for any interested party," he noted.

Transportation groups have been, in fact, surprised by the newfound source of revenue. "We didn't realize we had something valuable to lease until we were approached by several different parties," said Mary Goldberg, acting market planning specialist for the MBTA.

She estimated that leasing rights-of-way will net the MBTA roughly $1 million each year. The group will initially lease rights-of-way in downtown Boston in September. Soon after, it will begin leasing rights-of-way along the commuter rail lines that extend beyond city boundaries, Goldberg said.

Revenues derived from the leases will be spent to upgrade the transportation authority's own switching equipment.

Transit groups outside the Northeast are also considering leasing their rights-of-way. "It sounds like a feasible project," said Roger Wood, management services manager with the Chicago Transportation Authority. Potential buyers "will probably find it easier dealing with us than trying to get rights-of-way from the city or others," he said.

Industry analysts said carriers will use the networks built along the new paths to try to wrest large business users away from the Bell operating companies. The impending competition may eventually help drive down the price of switched and private-line-based services.

"The trend of transportation authorities leasing rights-of-way began in New York and is spreading across the country," said Gerald Mayfield, president of DMW Enterprises, a Stamford, Conn.-based consulting firm. "This is a much more significant trend than anybody realizes."

"The long-haul carriers want to use their own rights-of-way as often as possible," said Steve Sazegari, a senior analyst with Dataquest, Inc., a San Jose, Calif.-based consulting firm. Long-haul carriers that lease rights-of-way from transportation authorities have more control over the cost and use of the rights-of-way than they would have with the BOCs, he added.

"It is also far easier to get rights-of-way from [transportation authorities] than from the BOCs," said Sazegari, who is also a former telecommunications manager for a California bank.

Bypassers could use the rights-of-way to build links that would tie users to long-haul carriers' points-of-presence, an option that industry watchers said would rekindle the fading flames of bypass.

Transportation groups report that emerging and start-up bypass network operators are quickly buying up rights-of-way while the BOCs distance themselves from the proceedings.

One BOC, New England Telephone, said it has all the rights-of-way and fiber it needs to expand its network. But a source, who requested anonymity, argued otherwise. "[New England Telephone] doesn't want to buy the MBTA rights-of-way because they are afraid their participation in this process would draw attention to the bypassers," he explained.

According to DMW's Mayfield, bypassers equipped with rights-of-way in big cities pose a very serious threat to the BOCs. "Carriers are rising up to challenge the BOCs in their own backyards," Mayfield added. ☒

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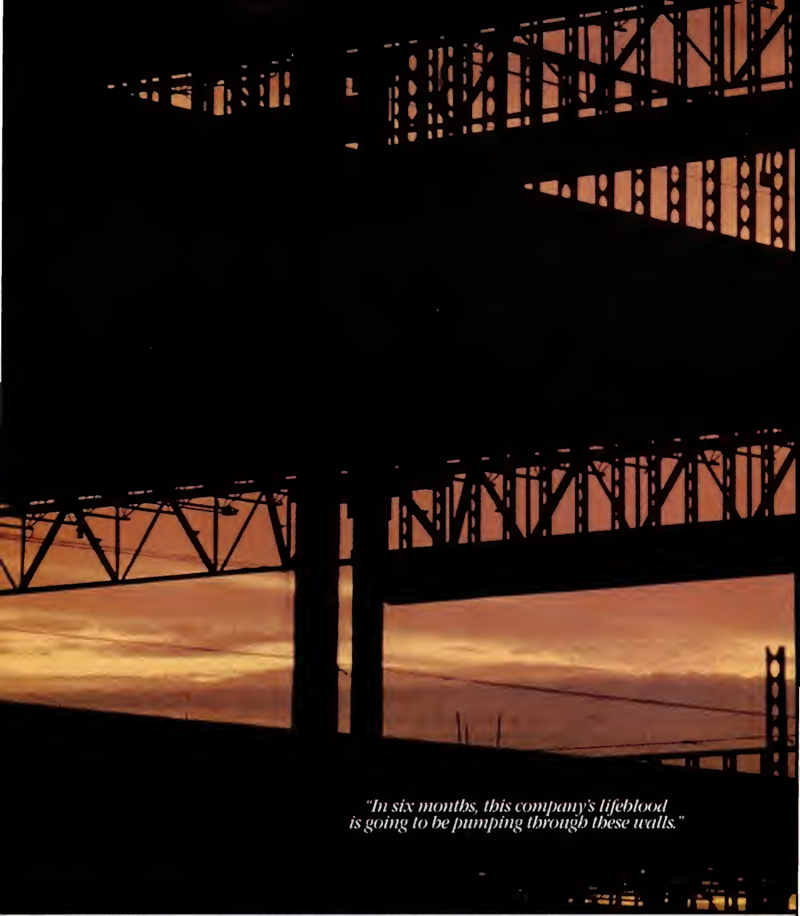

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

Feeling wealthy? You might want to invest in Japan's Nippon Telephone & Telegraph Corp., whose stock recently sold for more than $17,500 a share. The stock price has more than doubled since the former monopoly started publicly trading shares.

People & Positions

Centel Corp. announced several management changes in the company's telephone, cellular, cable television and corporate staffs.

George Kemple has been named to the new position of executive vice-president of operations for Central Telephone Co. Kemple, previously president of Centel Business Systems, will oversee the company's telephone operations. **Robert Reuss,** formerly president of Centel Communications Systems, will become vice-president of staff for Central Telephone.

Richard Vanderwoude has been named vice-president of Central Telephone Co. of Illinois/Ohio. **J. Thomas Brown** will become vice-president of Central Telephone Co. of Virginia/North Carolina.

Catherine Dudderar has been named head of Centel's Minnesota and Iowa telephone operations. **Robert Stephan** will assume Dudderar's position as assistant vice-president, regulatory, of Central Telephone.

William Laggett, president of Centel Cellular and Centel Electric and senior vice-president of Centel Corp., relinquished his duties with Centel's electric operations to concentrate on overseeing cellular operations.

George Hutton IV, former vice-president and general manager of Centel Cable Television Co. of Florida, was named to the new position of executive vice-president

(continued on page 12)

Knight-Ridder is highest bidder for Lockheed unit

Publisher buys Dialog Info. Services for $353m.

By Rex Bowman
West Coast Correspondent

MIAMI — Knight-Ridder, Inc. last week agreed to buy Lockheed Corp.'s Dialog Information Services, Inc. subsidiary for $353 million.

Dialog, one of the largest providers of information services in the U.S., supplies more than 91,000 users in 86 countries with some 320 data bases. For the year that ended Dec. 31, 1987, Dialog had a net income of $9.2 million on revenue of $98.1 million.

Knight-Ridder, based here, is already an active participant in the electronic information retrieval business. The company said the purchase of Dialog will double the size of its Business Information Services Division, which lost about $1 million last year.

The acquisition is expected to be completed in the third quarter of this year.

The $353 million price tag caught some analysts by surprise. Earlier this spring, when Lockheed first put the company on the block, several analysts had speculated that Lockheed was asking $200 million for the subsidiary. Those analysts also speculated that the price was too high ("Lockheed puts Dialog unit on the auction block, considers offers," *NW*, May 16).

However, Lockheed officials, who had denied rumors of the $200 million asking price, said they were not surprised by the size of Knight-Ridder's offer. "The price wasn't beyond our expectations," said Lockheed spokesman Robert Slayman. "It was a happy circumstance where the buyer and seller met, and we feel it definitely will enhance our shareholders' value."

Dialog is one of six companies in Lockheed's information systems group. Slayman said Lockheed has no plans to sell the other five businesses and that it sold Dialog only because it received so many offers. He would not disclose which other companies had attempted to buy the subsidiary.

Paula Dowell, a spokeswoman for Dialog, said there are no plans for a shake-up within the company.

Knight-Ridder publishes 30 daily newspapers, operates eight network television stations and offers numerous information services, including Commodity News Services, Tradecenter, Dataquote, The Journal of Commerce and Vu/Text.

According to Knight-Ridder, its various information services reach nearly 100 million people around the world every day. ◼

INDUSTRY BRIEFS

British Telecommunications plc recently said **STC PLC** will be a major supplier for its Flexible Access System (FAS), a fiber-optic network that spans the UK and is designed for business communications. STC, which is more than one-quarter owned by Northern Telecom, Inc., is expected to receive about $170 million in orders from British Telecom for delivery of multiplexing equipment beginning in 1990.

FAS, scheduled for completion in the mid-1990s, is an overlay network that is part of the UK's public network. It will allow large numbers of private circuits to be provided to business customers, who will use multiplexers controlled by net management software to mix connections of various circuits to the network as needs change. The network is intended to pave the way for wide-bandwidth services such as videoconferencing.

SynOptics Communications, Inc. has filed a registration statement with the U.S. Securities and Exchange Commission for an initial public offering of 1.5 million shares of common stock. The offering price is expected to be between $11 and $13 per share, raising capital of between $16.5 million and $19.5 million. Morgan Stanley & Co., Inc. and Hambrecht & Quist, Inc. will comanage the offering.

Tekelec, Inc. announced it has entered into an agreement to purchase the assets of **Protocol Technologies, Inc.** for $3.5 million in cash. Additional payments of up to $3 million will be made over the next three years, based on sales of products incorporating Protocol Technologies' development

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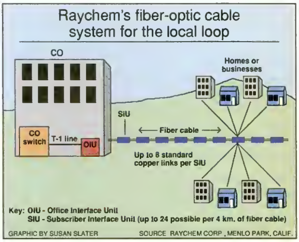

Raychem's fiber-optic cable system for the local loop

Key: OIU - Office Interface Unit
SIU - Subscriber Interface Unit (up to 24 possible per 4 km. of fiber cable)

GRAPHIC BY SUSAN SLATER

SOURCE RAYCHEM CORP., MENLO PARK, CALIF.

Carriers queue up for fiber local loop

Raychem Corp. is working on a fiber system it says will be as cheap to install as copper.

By Rex Bowman
West Coast Correspondent

MENLO PARK, Calif. — A number of carriers are making plans to test a new fiber-optic cable system for the local loop that, according to developer Raychem Corp., will cost no more to install than copper cable.

Ameritech, BellSouth Corp. and Nynex Corp. have already shown interest in the multiplexing technology's potential and plan to test the transmission system in early 1989. Germany's Deutsche Bundespost has signed a $30 million contract with Raynet Corp., the Raychem subsidiary developing the technology, to build a pilot system in West Germany.

BellSouth Enterprises has also agreed to invest $25 million in a newly formed Raynet subsidiary, Raynet International, Inc., which will market the system overseas. BellSouth Enterprises, Inc. has been working with Raynet to develop the software needed to manage the fiber cable system.

The local loop fiber system consists of an Office Interface Unit (OIU) connected to a central office switch or remote switching unit by a T-1 link. The OIU multiplexes up to 192 channels on a fiber cable running through a neighborhood or city.

At intervals on the fiber cable sit Subscriber Interface Units (SIU), which connect to homes or businesses via standard copper lines. As many as 24 SIUs can be located on a run of fiber cable up to 4 km in length. The SIUs convert the digital optical signals to analog signals. As many as eight copper links can be connected to each of the 24 SIUs.

Although the final link to the home or business is copper, it retains the large bandwidth capacity because it runs a very short distance from the SIU to the customer, according to George Ballog, marketing manager for Raynet. The system also allows for transmission of video signals on separate fiber lines within the cable.

The technology promises benefits for small businesses and regional offices of larger businesses, as well as residential customers. With fiber in the local loop, smaller businesses will have access to the same bandwidth capabilities as larger businesses that lease or own fiber lines.

> The technology promises benefits for small businesses and residential customers.
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Also, as a small business grows and needs more telecommunications capability, it will not have to pay the phone company to install a fiber line. The fiber will already be there.

"This is a fairly significant breakthrough in the area of costs," said Robert Humes, vice-president of operations planning and applied technology for Ameritech Services. "It becomes easier and more economical to upgrade a small business' communications once you've justified running fiber out there. With this technology, the cost begins to

(continued on page 12)

People & Positions

continued from page 11

of operations for Centel Cable. He will direct the daily operations of Centel's seven-state cable television unit.

Centel provides local exchange telephone service in nine states, as well as cable television service and cellular mobile communications systems. Centel also designs and installs advanced telecommunications and data systems.

The company said the management changes were made to strengthen Centel's three main lines of business — telephone, cellular communications and cable television. Centel recently announced it would sell its business systems operation, which distributes central office switches and private branch exchanges ("Centel says mutineers' bid defeated," *NW*, July 11).

Edward Botwinick, senior vice-president of **Unisys Corp.** and president of Unisys Networks, has been elected a trustee of Columbia University. Botwinick will serve a six-year term beginning this fall.

Botwinick is a founder of Timeplex, Inc. He was chairman of the board of directors and chief executive officer of Timeplex from 1977 until its acquisition by Unisys in January 1988, when he was elected to Unisys' management board.

Tellabs, Inc. has appointed **J. Peter Johnson** corporate controller. He will be responsible for analyzing, verifying and reporting the results of the company's financial and business transactions. Previously, Johnson was director of planning at Paradyne Corp.

Tellabs designs and manufactures voice and data communications equipment.

Northern Telecom, Inc. has appointed **Paul Myer** vice-president of public affairs for the company's office in Washington, D.C. Myer, formerly vice-president and director of government relations for Capital Cities/ABC, Inc., succeeds **Norman Dobyns**, who is retiring.

Glen Post III has been appointed executive vice-president and chief operating officer of **Century Telephone Enterprises, Inc.**

W. Bruce Hanks, formerly senior vice-president, has been named chief financial officer and treasurer.

Century Telephone Enterprises, headquartered in Monroe, La., operates in 12 metropolitan cellular markets and offers statewide and nationwide paging services through its subsidiary, Century Cellunet, Inc. ■

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An IDG Communications Publication

Carriers queue up for fiber local loop

continued from page 11

justify fiber in the local loop."

Telephone companies are interested in the new system because, up to now, installing fiber from the central office to homes and small businesses has been too expensive. Many public utility commissions have forbidden carriers to install large quantities of fiber in the local loop because all ratepayers must share the cost of installation even though they do not all reap the benefits.

"Why is this important? Because it lets telephone companies bring the fiber bandwidth to customers at a cost comparable to copper," said Ballog. "It allows them to put in the ground now the bandwidth they'll absolutely need in the future. And the public utility commissions will be thrilled about this."

The regional Bell holding companies seem to agree. "In my opinion, it's a major breakthrough," said Michael McNabb, director of technology development for BellSouth Enterprises. "I think this technology will put small business users on a more even footing with much larger business telecommunications users."

BellSouth, Nynex and Ameritech all plan to test the system in early 1989. None of them have selected sites for the tests, however.

Ballog said he expects the other RBHCs to negotiate for trials. "We've exposed all the Bell companies to the technology," Ballog said.

"It just so happens that these three companies [BellSouth, Nynex and Ameritech] moved faster. But we expect the others to jump on the bandwagon," he said.

Ballog would not reveal more about the technology itself, other than to say it was protected by numerous patents. ■

Industry Briefs

continued from page 11

efforts. The founders and principal shareholders of Protocol Technologies — Rex Hester and Fred Tinch — will enter into employment and noncompetition agreements with Tekelec for which they will receive payments of up to $2 million over the next five years.

Protocol Technologies, based in Raleigh, N.C., manufactures network test equipment. Founded in 1986, the company's sales for fiscal year 1987 totaled $2.75 million, with income before taxes of approximately $1.5 million.

Tekelec markets test equipment for digital equipment and networks.

Rockwell International Corp. has completed the acquisition of **Communication Machinery Corp. (CMC)** of Santa Barbara, Calif. The purchase price was $40 million. CMC, a supplier of software and hardware products for local nets, will become a part of Rockwell Communications Systems, a unit of Rockwell's electronics operations.

VMX, Inc.'s shareholders have approved the company's proposed merger with **OPCOM,** whose shareholders had previously given their consent to the merger.

VMX, formed in 1978, is a voice store-and-forward technology patent holder that currently licenses its technology to 30 manufacturers. Formed in 1983, OPCOM is a manufacturer of call-processing systems. ■

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

PC Yellow Pages of Norcross, Va., recently introduced personal computer software that provides a directory of 10,000 businesses with toll-free 800 numbers, and 5,000 local businesses in each U.S. area code, complete with telephone number, company name, address and zip code.

The software, which runs on IBM Personal Computers, costs $99.99. For additional information, contact the vendor at (800) 777-1470.

Carrier Watch

U.S. Transmission Systems, Inc. (USTS), a subsidiary of ITT Corp., recently extended private-line service to eight new cities, bringing the list of major metropolitan areas served to 75.

The cities are: Denver, Phoenix, Seattle, Las Vegas, Camden, N.J., Pleasantville, N.J., Portland, Ore., and West Palm Beach, Fla.

USTS' private-line network provides point-to-point communications between two cities.

Customers pay a flat monthly fee based on the distance between the two cities.

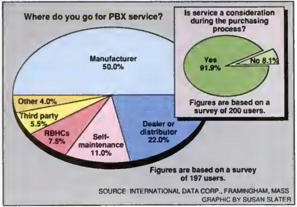
According to **USTS,** its private-line service saves subscribers 10% to 15% over comparable AT&T service.

A high-ranking **Southwestern Bell Telephone Co.** official recently urged members of the **American Council of the Blind** to become involved in the debate on how telephone companies should be regulated.

Speaking at the council's annual convention in Little Rock, Ark., Thomas Barry,

(continued on page 20)

PBX service trends



Figures are based on a survey of 200 users.

Figures are based on a survey of 197 users.

SOURCE INTERNATIONAL DATA CORP., FRAMINGHAM, MASS

GRAPHIC BY SUSAN SLATER

AT&T adds four new SDN options

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — In a move designed to help telecommunications managers manage change, AT&T last week announced four new optional features for its Software-Defined Network (SDN) service.

If the Federal Communications Commission approves the SDN filing, the features will become available on Aug. 25, the vendor said.

The first feature, Flexible Routing, lets the user reroute calls automatically to another location or be answered with a recorded announcement that instructs the caller to dial another site. The feature can be used to reroute traffic around downed sites. Users can submit routing plans in advance to AT&T.

AT&T said a change — which requires limited reprogramming of the SDN signal control point — can be instituted in less than a half hour.

The user will pay a $100 installation charge per network and a $300 monthly charge.

The second SDN feature, Partitioned Database Management, will enable a user to group locations into independent subnetworks. This feature would, for example, help a manager set up a mini-SDN to serve a subsidiary company or a new division acquired from another corporation. All calling costs would be listed on a single SDN bill, according to the carrier. The SDN user will pay a onetime $10,000 installation charge per new network.

The third feature, Location Sharing, will allow an SDN user to share access circuits to another customer's SDN location. AT&T targeted SDN customers that have heavy calling between their sites and those of another SDN user. The user will pay a $100 onetime charge for each customer location linked in this manner.

AT&T announced its intention to offer the final optional feature, Digital Routing, at the Communication Networks '88 conference here in January. The feature enables an SDN user to transmit digital data at 56K bit/sec between locations.

According to AT&T, users who send data over their SDN will pay about the same as users currently pay for Accunet Switched 56 service. ◼

Instor call-accounting software runs on AS/400

By Bob Wallace
Senior Editor

MENLO PARK, Calif. — Instor Corp., a telemanagement system vendor based here, recently introduced a call-accounting and traffic analysis software package that runs on IBM's new AS/400 minicomputers.

Originally designed for IBM's System/36 and System/38 minicomputers, the Call Analyzer software provides reports that help users allocate telecommunications expenses, recover costs, control telephone abuse and optimize use of calling services.

Instor said the software works with all IBM/Rolm Systems Division CBX switches as well as private branch exchanges made by Northern Telecom, Inc. and other major switch vendors.

Call Analyzer operates with PBXs that can handle up to 5,000 lines.

Call Analyzer software can be

(continued on page 20)

Huge telecom net serves convention

Southern Bell's fiber network set to service some 30,000 participants and media personnel.

By Paul Desmond
Staff Writer

ATLANTA — As the gavel sounds to open the Democratic National Convention today, 16,000 media personnel and 14,000 convention participants will put to the test a custom telecommunications network large enough to serve a city.

Southern Bell Telephone and Telegraph Co. has installed 9,000 telephones, 130 satellite links and more than 1,000 miles of fiber-optic cable to serve the convention. A network that size would serve a city of about 30,000 people, according to Richard Miles, Southern Bell's operations manager.

But the city this network serves will shut down when the convention ends on July 21.

The fiber network Southern Bell has set up will support video broadcasts, private-line services and the carrier's ESSX Service for Metro Convention Use (Metro ESSX). Interconnected fiber facilities will link the convention complex, news sites, hotels and other facilities.

Metro ESSX is a Centrex service that will support the convention and serve a 3,300-square-mile area surrounding Atlanta's Omni convention center and the adjacent media headquarters at the John L. Smith II Georgia World Congress Center.

Metro ESSX will allow convention participants to dial any one of 9,000 phones, toll free, using only four digits.

Outside callers can access the network by dialing 880, a special convention prefix, plus the final four numbers.

Service charge

Use of a telephone costs $148, a minimum charge that entitles users to one month's service. For that fee, Southern Bell will install the phone anywhere in the calling area, whether it is in a hotel miles from the Omni or on the convention floor. Traffic is routed through one of three AT&T

(continued on page 20)

WASHINGTON UPDATE

BY ANITA TAFF

BMS clears another hurdle. AT&T moved closer to introduction of its Bandwidth Management Service (BMS) last week when the Independent Data Communications Manufacturers Association (IDCMA) withdrew its petition asking the Federal Communications Commission to suspend and investigate the tariff ("AT&T's BMS service riles CPE vendors," *NW,* June 27). BMS will give customers more control in managing and monitoring network performance for Accunet T1.5. IDCMA had protested the service because it said AT&T did not provide enough information on it. The protest was resolved at an FCC meeting in which AT&T agreed to supply the information.

Waited long enough. Nynex Corp. went directly to U.S. District Court Judge Harold Greene last week for permission to purchase Private TransAtlantic Telecommunications System, Inc. The move would give the telephone company a 50% interest in PTAT, a fiber-optic cable linking the U.S. and the UK. Nynex forfeited the $10 million it had put up for a conditional interest in the project with Cable & Wireless PLC, while awaiting a recommendation from the Department of Justice. Nynex told Greene it had been waiting 14 months for the decision and that was long enough.

T-1 users group holds first meet. T-1 users seeking a vendor-independent users group may want to attend the first public meeting of the Independent T-1 Users Association (ITUA), scheduled to be held Sept. 26 to 28 in San Diego. The group's objective, stated at T-1 conference held here recently, is to provide a forum for users and vendors to exchange information on such T-1 issues as performance, advances in technology, standards and regulation. For more information, call Raymond Beavan at (216) 622-5567. ◼

IF YOUR COMMUNICATIONS LACK DIMENSION...

Digital ESSX is a servicemark of Bell South Corporation
Centron is a servicemark of Northwestern Bell Telephone Company
Intellipath is a servicemark of NYNEX Corporation
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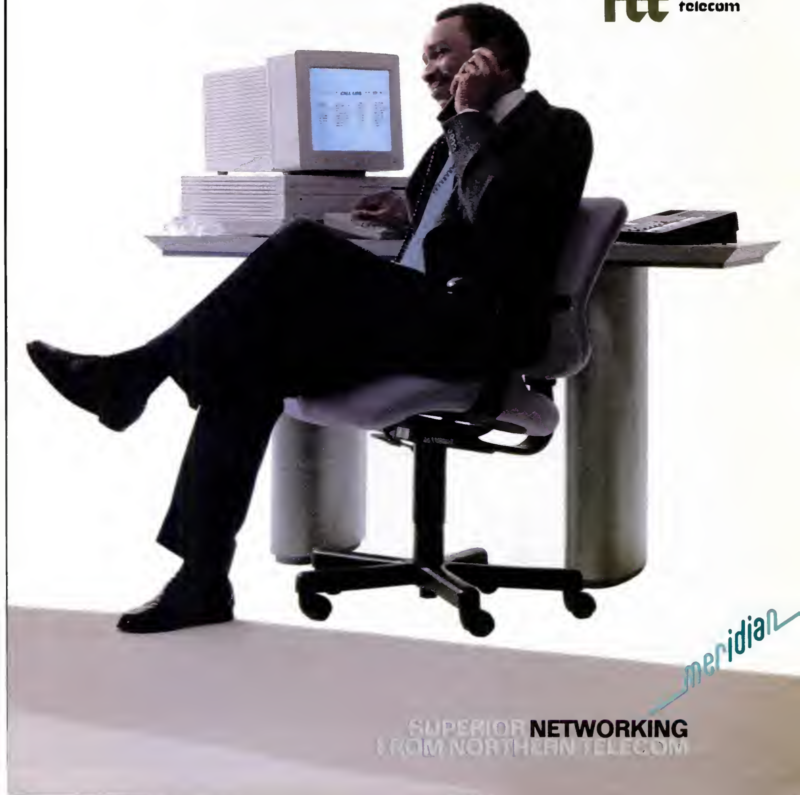

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Don't waste your time on a complicated communications system. Meridian* Digital Centrex is so simple to operate, the phone on your desk is all you need.

Meridian Digital Centrex is a package of sophisticated voice, data, control and administrative services. The system offers you multiple line coverage without additional and complicated equipment to buy or maintain. Installation is a simple connection to the phone jack on your wall with standard twisted-pair wiring instead of cumbersome 25-pair cable.

Available from your telephone company, Meridian Digital Centrex lets you tailor your service with more than 200 convenient features such as calling name identification and variable data speeds up to 64 kbps.

And with Meridian Business Sets, you get single-button access to features without having to memorize or look up complicated access codes.

Ask your telephone company how Meridian Digital Centrex can accommodate all your communication needs, whether they're basic calling features or advanced ISDN capabilities. You'll see why no other business communications system is as simple, practical and complete.

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SIMPLIFIED NETWORKING FROM NORTHERN TELECOM

IF LACK OF CONTROL LEAVES YOU FLAT...

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Because businesses grow, restructure and relocate, the issue of control is more important than ever. Count on Northern Telecom and your local telephone company to provide a telecommunications management system that puts you in charge.

Meridian* Digital Centrex gives you what you need: the most sophisticated combination of voice and data features available on centrex. And that includes the management and control features to match your dynamic business.

For single-site operations, Meridian Digital Centrex features provide station message detail recording, facilitate moves, monitor feature usage and control line access privileges.

As your business expands, call on the added capabilities of Business Network Management to provide additional multilocation, network-wide management functions. These include: traffic data analysis, network reconfiguration, automatic route selection, maintenance, and fault detection as well as the basic Meridian Digital Centrex control features.

Gain the total control your growing business needs. Ask your phone company how Meridian Digital Centrex, with Business Network Management, can add a new dimension to your business.

nt northern telecom

Call-accounting software for IBM PCs introduced

By Bob Wallace
Senior Editor

BURBANK, Calif. — Account-A-Call Corp. recently introduced a call-accounting software package that runs on IBM Personal Computers and compatibles.

The PC Telephone Usage Management System (PC TUMS) processes call reports using information transmitted to the personal computer from private branch exchanges or Centrex systems over an RS-232 link, according to a spokesman for Account-A-Call, a telemanagement system vendor based here.

PC TUMS works with PBXs or Centrex systems supporting up to 200 telephone stations. The software consists of three modules, each of which produces a different report.

PC TUMS/Small Business module reports on trunk usage and highlights calling activity beyond user-set parameters.

PC TUMS/Billback module produces reports that help users bill clients for telecommunications services. PC TUMS/Traffic module reports on telephone usage by area code, local exchange and long-distance service. This information allows the user to perform network analysis and cost optimization.

All three modules can be purchased in a package called PC TUMS/Complete.

The vendor suggests customers purchase Tadpoll — a buffer device that collects and stores call records from the telephone system. Tadpoll downloads data to the personal computer at a time predetermined by the user.

"This means you don't have to dedicate your personal computer to a call-accounting application," said Kevin Young, Account-A-Call general manager.

Account-A-Call sells a series of Tadpolls ranging in price from $600 for a unit with 64K bytes of memory, to $3,995 for a model with 2M bytes of memory.

The vendor said its clients include WordPerfect Corp. and E.I. DuPont de Nemours & Co., Inc.

PC TUMS is available now and can be purchased from Account-A-Call or through a network of distributors across the U.S. The vendor also sells telemanagement systems for mainframe computers. For additional information, contact Account-A-Call at (800) 458-7513. ◘

Instor software runs on AS/400

continued from page 13

used to generate reports that summarize telephone station usage, trunk usage and departmental telephone usage. The system can also be programmed to create custom reports.

The system uses SQL, a standardized method of managing information in data bases. SQL support enables users to access other SQL-compatible data base management systems running on computers made by different vendors. This speeds construction of the facilities management data base by allowing the user to pull relevant data off multiple data bases.

An Instor spokeswoman said the AS/400 version of the software will be beta-tested at two sites in September, but she declined to identify the users.

Call Analyzer will be available in October and will range in price from $3,500 to $6,000, depending on the number of lines the PBX supports.

The vendor sells its telemanagement software directly to users and through 10 distributors and sales agents.

The company will develop what it calls Site Telemanagement applications — software modules that support traffic analysis, an inventory data base and a switch data base — that will enable users to track telephone station moves, adds and changes. This software will not be available until early 1989.

For additional information, Instor can be reached at 199 Jefferson Drive, Menlo Park, Calif. 94025; (415) 326-9830. ◘

Carrier Watch

continued from page 13

Southwestern Bell's vice-president for revenues and public affairs, said current regulatory policies discourage the Bell companies from offering certain services beneficial to the blind.

Those services include identification of callers by special ring, call blocking, computer query about bills, dial-up stock market information and voice mail, Barry said.

He said the Bell operating companies are barred from offering many of these services and also lack the flexibility to compete when allowed to offer them. Stating that residents, small businesses and the disabled have the most at stake, he urged the group and similar organizations to join in the debate. ◘

Huge net serves convention

continued from page 13

1AESS analog switches at Southern Bell's Courtland Street office, which Miles said supports 200,000 lines and is the largest single switching area in the Southeast.

Miles said he also expects to install thousands of modular telephone jacks for reporters with laptop personal computers who want to transmit copy over the telephone. Also, 115 temporary coin or credit card operated telephones have been installed. These will accommodate personal computers and provide access to six long-distance carriers.

This way, reporters can "directly communicate with a data base anyplace," Miles said, "Paris, Tenn., or Paris, France."

Miles said the company expects use of more than 100 Satellite News Vehicles (SNV), vehicles that originate satellite broadcasts, at the convention. In comparison, only three SNVs were used at the San Francisco convention in 1984.

To handle the video traffic, as well as voice and data traffic, Southern Bell installed 1,063 miles of fiber-optic cable. Each fiber strand will support about 6,000 voice-grade circuits or one video circuit, Miles said, adding that the fiber strands are capable of carrying twice that much.

One video "loop" will cost users more than $4,000 to install. A loop is a fiber cable that Southern Bell places wherever the user specifies.

"If they want a video signal hanging out of a tree, we'll hang it out of a tree — literally," Miles said. "And some of them are probably going to want that."

He said the fiber network is crucial to deliver interference-free signals. Because Atlanta is hilly and congested with high-rise buildings, microwave signals were not a viable alternative.

With the volume of broadcast signals expected, the city could have experienced "video gridlock" by using microwave.

The convention network, which took about a year to build, is part of a $1.6 billion three-year project under way in Georgia called State of the Art Statewide. In the planning stages since late 1986 and kicked off officially on May 27, 1987, the project involves upgrades to 98 of Georgia's 179 central offices. It called for the installation of an additional 70,000 miles of fiber, which is already in place in the state.

The fiber network installed for the Democratic Convention was planned as part of State of the Art Statewide, but it was put in place two years ahead of schedule to accommodate the convention. The facilities will be put to commercial use after the convention, Miles said.

He said Southern Bell made sure that Georgia ratepayers would not have to pay for anything installed solely for the convention. The cost of any item installed for convention use that cannot be used later is passed on to convention attendees.

Meanwhile, South Central Bell Telephone Co. is preparing New Orleans' Superdome for the Republican National Convention to be held there Aug. 15 to 18. The configuration there will be much the same as Atlanta's, except the toll-free calling area will not be as large.

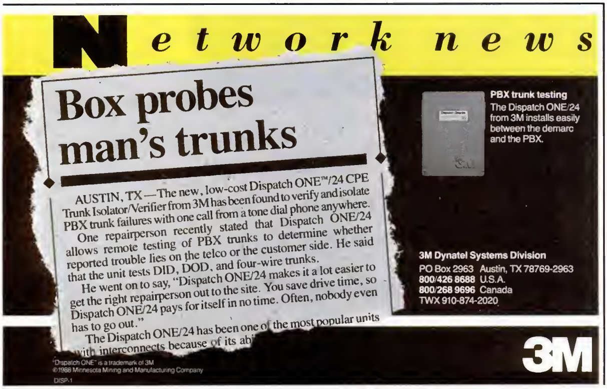
But South Central Bell already had the technology and employees in place to handle the onslaught of media and political types.

"South Central Bell is used to handling major media events in New Orleans, from Super Bowls to a visit by the pope," said Fred Nodier, general manager in charge of South Central Bell's telecommunications services for the convention.

In addition to the 4,000 telephone lines already in place in the Superdome, South Central Bell will add 5,200 more lines. These Centrex lines will have their own exchange (762, or RNC) and will support four-digit dialing.

The Centrex network covers the New Orleans business district, which includes the Superdome, print media and Republican National Committee headquarters at the Hyatt Hotel, as well as the rules committee base at the Rivergate Hotel and South Central Bell's largest switching office, located one-half mile from the Superdome.

Don Conner of South Central Bell's public relations department described the magnitude of the Republican National Convention as being "like 10 superbowls." ◘



Network news

Box probes man's trunks

AUSTIN, TX—The new, low-cost Dispatch ONE™/24 CPE Trunk Isolator/Verifier from 3M has been found to verify and isolate PBX trunk failures with one call from a tone dial phone anywhere.

One repairperson recently stated that Dispatch ONE/24 allows remote testing of PBX trunks to determine whether reported trouble lies on the telco or the customer side. He said that the unit tests DID, DOD, and four-wire trunks.

He went on to say, "Dispatch ONE/24 makes it a lot easier to get the right repairperson out to the site. You save drive time, so Dispatch ONE/24 pays for itself in no time. Often, nobody even has to go out."

The Dispatch ONE/24 has been one of the most popular units with interconnects because of its ab

PBX trunk testing
The Dispatch ONE/24 from 3M installs easily between the demarc and the PBX.

3M Dynatel Systems Division
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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

Fujitsu Ltd., Japan's largest computer manufacturer, last week joined X/Open, a consortium of 13 manufacturing companies working to develop a multivendor common applications environment. Other members include AT&T, Hewlett-Packard Co., NCR Corp., Unisys Corp. and Digital Equipment Corp.

Data Packets

The **University of Colorado** in Boulder's master of science program recently was given $78,920 worth of T-1 carrier and automatic trunk testing equipment from **3M Corp.'s Dynatel Systems Division** in Austin, Texas.

The equipment will provide students with a hands-on method of determining circuit problems, said engineering professor Floyd Becker.

The donation included 18 T-1 carrier test equipment units used in two T-1C carrier systems. Included in those units are 3M Venator brand channel access test sets, traffic monitoring panels, echo-canceler test sets and DS1 line monitors.

The gift also included a Start controller for an automatic trunk-testing system that can be used with the university's laboratory program private branch exchanges and assorted test lines.

SATELLEASE, Inc. in Chicago recently signed a multiyear contract to build very small aperture terminal networks for **Micro-Com Industries, Inc.**, a Wayne, Pa.-based supplier of value-added data communications network services.

SATELLEASE will handle such responsibilities as materials management, site surveys, landlord negotiation,

(continued on page 22)

GE Info. Services offers EDI conversion software

Mainframe pack translates from other formats.

By Bob Wallace
Senior Editor

ROCKVILLE, Md. — GE Information Services last week introduced a mainframe software package that can be used to control different types of incoming and outgoing electronic data interchange (EDI)-formatted transactions.

Targeted at large, multidivision corporations, EDI*Central System enables customers to translate EDI-formatted documents to and from formats used by internal business system applications running on local and remote computers.

EDI*Central System runs on IBM mainframes under the OS and MVS operating systems.

EDI, the computer-to-computer exchange of standard-formatted business information, helps users eliminate paper-based transactions by standardizing document formats.

Application routing

Communications software on the user's computer takes incoming EDI mail — in the ANSI X12 format — off of a value-added network. EDI*Central System then translates these documents into a proprietary GE Information Services "flat" — a fixed length file. The software then routes the file to the appropriate application within the company.

Data from the flat file is mapped into a file defined by the user's application or to an application input file, explained Lincoln Yarbrough, distributed host systems product manager for GE Information Services.

EDI*Central System software does not feature any communications capabilities. A separate communications software program, which would reside on the mainframe, is needed to transmit the electronic document onto a value-added network.

Receipt checks

Yarbrough said EDI*Central System enables the user to monitor each document translation and check whether or not EDI transactions were received by the company's trading partners.

Brian Dearing, product marketing manager for GE Information Services, said the firm is already developing additional EDI software products, but he would not describe them or say when they would be formally announced.

EDI*Central System, available immediately, costs $20,000 for the first copy and $12,000 for each additional copy. The license allows the making of multiple copies of the Interface and Print Programs portions per company. The vendor said the annual subscription service fee is $2,400 after the first year.

For additional information, contact the vendor at (800) EDI-KNOW in the U.S., or call your local GE Information Services' representative. ◼

NEC America introduces modem control system

By Jim Brown
New Products Editor

SAN JOSE, Calif. — NEC America, Inc.'s Data Communications Products Division last week introduced a modem network system that supports up to 504 modems.

The Intelligent-Series (I-Series) system consists of a chassis, controllers and modem boards that operate at up to 2,400 bit/sec. NEC America is positioning the system to compete against similar products sold by such modem giants as Racal-Milgo.

What makes the system intelligent, according to NEC, is that it allows users to configure, monitor and test local and remote modems from a central site.

At the heart of the system is the I1000 Intelligent Chassis, which has 16 slots to support modem boards and one slot to support a chassis controller, dubbed the I1002 Intelligent Subcontroller. The I-Series can house up to 16 of the $1,200 I1000 Intelligent Chassis in either 19-in. or 23-in. racks.

The $165 I1002 Intelligent Subcontroller board controls the operation of modems within a chassis. A Digital Equipment Corp. VT-100 terminal — or an IBM Personal Computer emulating a VT-100 — linked to the board via an RS-232 port issues commands to configure, test and monitor modems in the chassis.

Users with more than one chassis employ the I1001 Intelligent Controller to control the entire system. This controller resides in an I1000 Intelligent Chassis and requires four slots. It has a keypad and an eight-line

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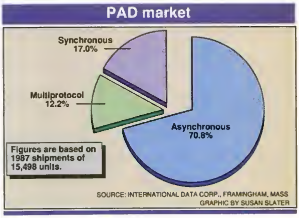

PAD market

Figures are based on 1987 shipments of 15,498 units.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS
GRAPHIC BY SUSAN SLATER

Fax firm eyes future with Netrix #1-ISSs

Beta test shows clear benefits of combination circuit/packet switch vs. Dynapac network.

By Paul Desmond
Staff Writer

VIENNA, Va. — A facsimile network operator based here recently reported that its seven-month beta test of Netrix Corp.'s combination circuit/packet switch has so far been a success, even though the system is operating in only one of its capacities.

The customer, NetExpress Communications, Inc., has been testing two Netrix #1-Integrated Switching System (#1-ISS) switches in its network since last December. The installation is the first for Netrix, a start-up founded in 1985.

Even though the company has implemented only the packet-switching functions of the system, NetExpress President Barry Wessler said the switch's full redundancy and network management capabilities have performed well. The modular system has also given NetExpress needed expansion capability.

Later this year, when the T-1 interface becomes available for the #1-ISS, the switch will enable the company to replace many of its T-1 multiplexers, according to Wessler.

Nationwide net

NetExpress, an affiliate of DHL Airways, Inc., operates a nationwide data network supporting Group IV digital facsimile machines, which use the X.25 packet-switching protocol.

The network is also used by DHL Airways to trace and track packages and to support the company's Satellite Overnite facsimile service.

The network currently consists of four Dynatech Corp. Dynapac Model 60 packet switches, two each in the company's two major switching centers, one here and the other in San Francisco, according to Nicholas La Forgia, director of network operations for NetExpress.

Dynapac Model 8 and Model 12 switches are installed in nine other company switching centers: Boston, New York, Washington, D.C., Miami, Chicago, Houston, Seattle, San Francisco and Los Angeles.

International connections include satellite links to Post, Telegraph and Telephone administration networks in the UK, Japan, Hong Kong and Australia.

Two #1-ISS switches were installed alongside the Dynapac switches here in December, La Forgia said. Another #1-ISS is on order for San Francisco, according to Wessler. All switching centers are connected with 56K bit/sec or higher speed dedicated lines.

T-1 links, outfitted with multiplexers from Avanti Communications Corp., are used to connect headquarters here to New York and San Francisco. Other T-1 facilities — one from San Francisco to Jamesburg, Calif., and one from headquarters to Etam, W. Va. —are used to access international satellite stations.

In all, Wessler said he expects to install from 10 to 20 Netrix switches during the next several years. In La Forgia's words, the technology of the Netrix switch is light-years ahead of the Dynapac switches.

Advanced technology

"There's really no comparison between the #1-ISS and the Dynapac switches," La Forgia said. "The Netrix switch offers combination circuit and packet switching and is a lot faster than the Dynapacs. In one switch, I

(continued on page 22)

NEC America introduces system

continued from page 21

LCD screen capable of displaying up to 21 characters per line.

With the $345 Intelligent Controller, users are able to set configuration options on individual modems in each of the system chassis. The Intelligent Controller is also able to test and monitor the modems in each chassis, as well as remote modems.

The Intelligent Controller is linked to the Intelligent Subcontroller on up to 15 local chassis via a daisy-chained RS-232 link. Commands are issued from the Intelligent Controller front panel or a terminal linked to the Intelligent Controller via RS-232. Those commands are transmitted to Intelligent Subcontrollers, which then communicate with individual modems.

The system also includes a battery backup that protects configuration settings during power failures.

The chassis supports either NEC America 12432C or 12432 modem boards. Both boards support two dial-up, full-duplex, V.22bis-compatible modems operating at up to 2,400 bit/sec. Both also support NEC America and Hayes Microcomputer Products, Inc. autodial protocols.

The $995 12432C supports up to Class 5 of Microcom, Inc.'s Microcom Network Protocol (MNP), while the $895 12432 supports up to MNP Class 4.

The 12432C works with the $695 remote-site N2431C, and the 12432 works with the $575 remote-site N2431.

NEC America's Data Communications Products Division can be reached by writing to 110 Rio Robles, San Jose, Calif. 95134, or by calling (408) 433-1250. ◼

Fax firm eyes future with Netrix #1-ISSs

continued from page 21

have a mux and a packet switch."

At the heart of the #1-ISS are the Switching and Processing Modules (SPM) that support circuit and packet switching, according to Thomas Jones, vice-president of marketing for Netrix.

Each SPM printed circuit board contains a packet switch that supports 150 packet/sec and a time-division multiplexed 4.096M bit/sec circuit switch. The Model 30 switch holds up to four SPMs, while the Model 50 holds eight and the Model 70 holds 16.

Wessler has already installed Netrix's #1-ISS Network Management System to monitor his network. That system consists of Netrix software running on an Apollo Computer, Inc. DN 3000 workstation with a graphics interface.

Using a three-button mouse with Icons representing the various parts of the network, an operator can graphically reconfigure any part of the network from a central location, without the need for extensive textual commands, Jones said. Software on the workstation reconfigures the network from the graphics commands the user enters.

Color codes are used to alert operators to network problems. Using the mouse and multiple windows, a problem area can be quickly magnified to isolate the exact cause of the problem, Jones said.

"You've got to see it to appreciate it," Wessler said. "The switch is really very nice in the network control area." ◼

Data Packets

continued from page 21

permit acquisition and site preparation for up to 900 VSATs. This marks Micro-Com's entry into the VSAT field. In the past, the company relied on terrestrial connections to support its customers.

Tymnet, McDonnell Douglas Network Systems Co. in San Jose, Calif., last week announced it will hook up with a public data network in South Korea to provide U.S. fans of the Summer Olympics with a messaging service to communicate with U.S. athletes and access to an Olympics data base.

The network, called **Seoul/Tym,** is made possible through an international connection provided by MCI International between the Tymnet public data communications network and South Korea's Data Communications Corp. (DACOM) DACOM-Net Service (DNS).

DACOM is South Korea's primary common carrier of data communications, and DNS is the country's only public packet-switched network.

U.S. fans will be able to call a toll-free number to leave verbal messages for a team or athlete. Verbal messages sent via Tymnet's OnTyme electronic mail system will be transcribed into electronic messages. The service will cost less than $5.

The Olympics data base, which will include up-to-the-minute information on the games, will be accessible through any personal computer or ASCII terminal. Users will be charged less than 50 cents per call plus a set-up fee.

Terminals will be available for use in convenient locations such as shopping centers, according to Tymnet. The services will be available from Sept. 2 to Oct. 5.

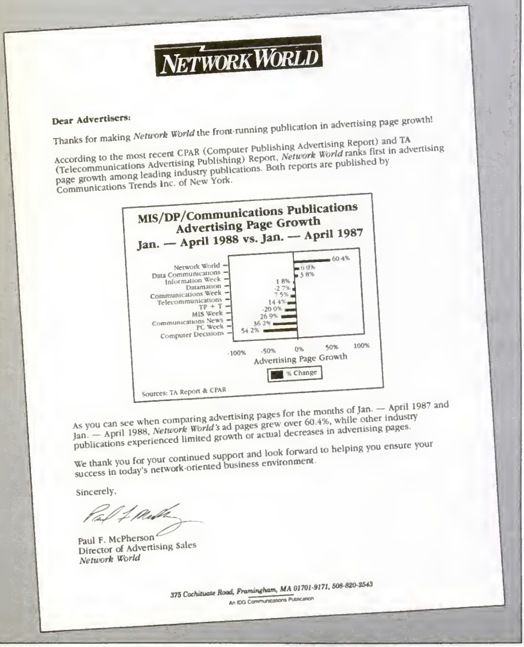
Wisconsin Electric Power Co. recently agreed to buy a variety of digital microwave communications products from **Granger-Telettra,** a Santa Clara, Calif.-based joint venture between Granger Associates and Telettra U.S.A.

The power company declined to say how much the equipment cost.

Included in the purchase was a turnkey digital microwave radio system composed of a DTI 45 Drop and Insert Multiplexer, DTM 45 Terminal Multiplexer and DTR 6 and DTR 18 Digital Microwave Radios.

The 6-GHz DTR 6 is the heart of the system, Granger-Telletra said. The compact unit features angle diversity, which requires just one antenna and improves microwave signal quality and availability by a typical factor of 100%, according to the company. ◼

Network World ranks first in advertising page growth.



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MIS/DP/Communications Publications Advertising Page Growth Jan. — April 1988 vs. Jan. — April 1987

Sources: TA Report & CPAR

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>
> **Frank Dzubeck**
> President
> Communications Network Architects, Inc.
> Washington, D.C.

Netnotes

3Com Corp. said it has reduced the price of two of its Ethernet and Token-Ring Network adapter boards by 10%, effective immediately.

The EtherLink II will sell for $445, down from $495, and the Token Link will cost $595, down from $650.

3Com attributed the price decreases to manufacturing efficiencies.

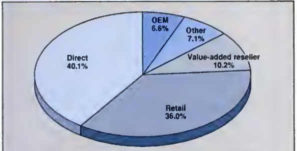
Gateway Communications, Inc. recently introduced a 16M bit/sec local net adapter card, the G/Ethernet, for use with IBM Personal Computer ATs and compatibles.

The G/Ethernet adapter features data transfer rates of 16M bit/sec, according to the company. The 16-bit Personal Computer AT adapter has 64K bytes of on-board random-access memory with 16-bit data transfer to the personal computer, making it the fastest in Gateway Communications' Ethernet product family. The adapter costs $525.

In other news, Gateway signed an OEM agreement with **BICC Data Networks, Inc.** Under the terms of the pact, Gateway will purchase a variety of Ethernet networking products from BICC and incorporate them into the Gateway G/Ethernet local network starter kit.

The agreement covers all of BICC's Isolan products, including transceivers, repeaters and multiport repeaters. ◼

PC LAN suppliers



Figures are based on a survey of 157 users in large PC sites.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY SUSAN SLATER

Kinetics FastPath gateway ties LocalTalk, Ethernets

Version boasts auto start, configuration feature.

By Laura DiDio
Senior Editor

WALNUT CREEK, Calif. — Kinetics, Inc. last week introduced an enhanced version of its FastPath gateway for connecting Apple Computer, Inc.'s LocalTalk networks to Ethernets.

Called FastPath 4, the product is the first Kinetics gateway that automatically configures itself when connecting Apple local networks to Ethernet nets. Earlier versions connected LocalTalk networks to Ethernets but did not have the automatic start and configuration capability.

FastPath 4 is the fourth generation of Kinetics' original FastPath, which was introduced in December 1985, according to Thomas Cromelin, Kinetics product marketing manager. It is a stand-alone device based on a Motorola Corp. 68000 processor. It has 256K bytes of memory, expandable to 512K, and supports net connections.

The software portion of the product is the FastPath Manager, which is used to configure and run the gateway. It can be operated from any Macintosh connected to an Ethernet or LocalTalk net.

FastPath 4 enhancements include a new plug-and-play feature that allows users to install a FastPath gateway without doing any additional programming.

Users can also configure the FastPath 4 gateway for Internet Protocol (IP) routing from either the LocalTalk or the Ethernet side of the network.

"In Apple-only LANs, which include Ethernet networks, FastPath 4 automatically starts and configures itself. However, users wanting to run the IP routing protocols must configure it themselves," Cromelin explained. "The reason for this is that any new nodes on Apple networks automatically choose their own addresses because the networks are all configured the same. Conversely, IP addresses must be assigned by the user because they require special parameters."

The FastPath Manager software is said to simplify the networking of Apple Macintoshes and Transmission Control Protocol/Internet Protocol hosts commonly found in Unix environments, Cromelin noted. It does this via the K-Star address management feature, which enables the gateway to assign IP addresses to Macintoshes on the LocalTalk network.

When used as a bridge connecting AppleTalk networks, FastPath 4 can be installed and run with no user configuration. In AppleTalk-only environments, FastPath 4 automatically begins functioning once Ethernet or LocalTalk cables are attached.

Optional configuration and net management software can be loaded from any Macintosh on the network, making it possible for a network manager to set up multiple FastPath gateways from a single Macintosh.

Additionally, the latest FastPath version has both thin-wire and standard Ethernet connectors built in. Previously, FastPath was sold in two different models: one for thin-wire Ethernet, priced at $2,750, and another for standard Ethernet wiring, priced at $2,500. FastPath 4, however, features both types of connections and is priced at $2,495, Cromelin said.

Volume shipments of FastPath 4 will begin on July 22. The current FastPath Models 2 and 3 will be discontinued. The company will provide upgrades to those models in October.

Kinetics, a wholly owned subsidiary of Excelan, Inc., can be reached by writing to 2500 Camino Diablo, No. 110, Walnut Creek, Calif. 94596, or by calling (415) 947-0998. ◼

WD's Duggan talks about LAN strategy

Local net unit chief discusses communications' role in the firm's climb back into the black.

Western Digital Corp. (WD), an 18-year-old company with 3,500 employees, recently joined the ranks of the Fortune 500. Although the company was in Chapter 11 just five years ago, it has been profitable for the last three years, a turnaround that can be attributed in part to its Communications business unit.

That division, which makes network interface products, hopes to challenge 3Com Corp. and other vendors to emerge as one of the top suppliers of network hardware products.

Network World *Senior Editor Laura DiDio recently spoke with Paul Duggan, general manager of WD's local-area network business unit, about the firm's business, its local net strategies and the expansion of its product portfolio.*

Would you tell us about WD's local network business?

WD has four strategic business units: Storage Products, Imaging, Integrated Systems and Communications, which includes local-area net products. While the Communications unit isn't the largest portion of WD's business, we're doubling our business quarterly, well ahead of the LAN industry in general, because we are relative newcomers to networking. This rate of growth obviously can't be sustained, but WD expects its networking business to continue strong, keeping ahead of the industry.

We've been in the networking business for about four years. Our first offering was a token-bus product, which we began shipping in 1984. We later relaunched our local net business with products based on the Ethernet and Starlan standards, which

(continued on page 26)

LANMARKS

BY ARNIE LAPINIG

Integrating the Big 3: DOS, OS/2 and Unix

Networks of the future will have to accommodate at least three major operating system environments: DOS, OS/2 and Unix.

One thing is clear: Over the next three years, no operating system will achieve the level of dominance DOS has enjoyed, making the challenge of integrating these environments into the corporate network even more complex.

There are two distinct approaches to this integration. DOS could be made to run as a process under OS/2 or Unix and then the resultant pair could be run under the one remaining operating system. Or a standard means of interprocess communications could be used to allow common messages to be understood by all three systems. This way, applications could exchange meaningful information with each other, regardless of the network's operating system.

In the distributed computer world of the future, this second approach is clearly preferable. It maintains the integrity of applications running in each operating system and allows for interprocess communications between nodes. It also ensures that the user interface for each system is not compromised.

The first approach ignores the fact that many DOS applications have been customized and no longer use standard DOS facilities. Also, having two multitasking operating systems cooperate in a single environment would present significant technical hurdles.

In designing for interoperability, OS/2 and Unix nodes would become servers for DOS workstations as well as for each other. These multitasking operating systems are ideally suited

(continued on page 26)

Lapinig is vice-president of marketing at 10NET Communications, a Dayton, Ohio-based division of Digital Communications Associates, Inc.

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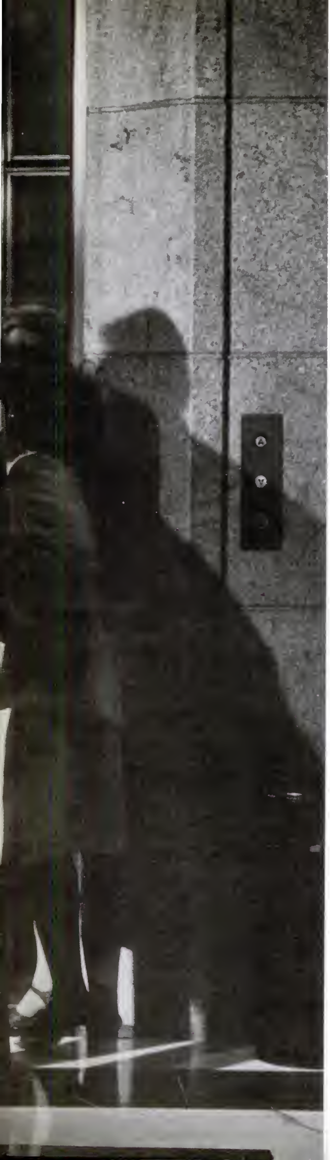

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Integrating the Big 3: DOS, OS/2 and Unix

continued from page 23

for server functions because of their extensive security features and backup facilities. DOS applications could then send requests to the appropriate server. OS/2 and Unix applications could also exchange requests.

However, interoperability in a distributed computing network is not without its own hurdles and stumbling blocks.

First, there is no standard Unix implementation. The Unix world is littered with variants that, in some cases, present significant compatibility problems. Today, Xenix, AT&T's Unix System V, Sun Microsystems, Inc.'s SunOS and SunOSF are all vying for pieces of the Unix market.

The second roadblock involves differences between the operating systems themselves. It starts with something as basic as file system naming conventions.

DOS file names can be up to 12 characters long. OS/2 file names use the same conventions as DOS. However, Unix file names can be up to 14 characters long.

File formats are also a consideration. OS/2 and DOS file formats terminate differently than Unix files. Future local net operating system software has to be written to account for these differences and make them transparent to the application.

Many potential solutions to the question of interoperability exist, and most of them revolve around a standard method of exchanging file requests between nodes on the network.

One of the most common of these methods is a protocol known as the Server Message Block (SMB).

SMB requests are used by Microsoft Corp.'s OS/2 LAN Manager to communicate file system requests. Other DOS-based local net operating systems such as 10NET Communications' 10NET and Microsoft's MS-Net also use SMB to initiate as well as service remote file system requests.

SMB implementations exist on both Unix and Xenix. Therefore, the objective of allowing nodes using different operating systems to interoperate is close to being achieved.

There also exists a higher level of interoperability between applications. The promise of distributed computing lies in the ability of one program to communicate intelligently with another, whether in the same machine or not.

Thus interprocess communications, in the context of networked workstations and servers, becomes the next challenge. A number of mechanisms are currently being touted by various camps. One is IBM's Advanced Program-to-Program Communications; the other is Microsoft's Named Pipes. There are appropriate situations for using one or the other method, but it remains unclear whether either one will dominate in the industry.

Clearly, networking will become more complicated before it gets simpler. Having a number of environments with large installed bases makes the transition especially difficult. It is up to local network vendors to recognize this basic premise of networking life and make the necessary research and development investments to ensure that these various environments can coexist on their networks.

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WD's Duggan talks about LAN strategy

continued from page 23

started shipping in volume about a year ago. We have token-ring products in development now. Shipments [of those products] are expected by year's end.

Describe your local networking strategy.

We have a vertical integration strategy. We put more functionality into our silicon in order to drive down costs. AT&T acts as a foundry for us — they manufacture the silicon wafers that we've designed.

The end result is that subsequent releases of our products have more power but fewer components. They are pin-for-pin hardware- and software-compatible with their predecessors, but they cost less.

Our costs come down about 20% to 30% a year, and the bulk of those savings are passed on to our customers. For instance, we've reduced the price of our Starlan products about $40 a node in the past year that they've been on the market.

There are two aspects to this strategy: As we increase functionality and reduce cost, we expand the markets and offer lower costs to customers.

WD's LAN products are manufactured in our factories in California, Puerto Rico and Cork, Ireland. WD produces a total of 12 million boards a year, including our network boards. Again, the end result is very low cost and high reliability. We get to leverage off all of WD's strengths in manufacturing, distribution, R&D and so on.

Would you describe the product portfolio?

We have Starlan interface network adapters for the [IBM] PC XT, and this month, we're beginning volume shipments of the Micro Channel Starlan product. This will be fairly significant for us because there are tens of thousands of existing Starlan networks, and users are buying large quantities of Micro Channel PCs.

Our OEM customers want both Ethernet and Starlan products from one source. I don't know of any other Micro Channel Starlan board on the market today. It rounds out our product line. All of our Starlan and Ethernet offerings are completely software-compatible.

We introduced the Ethernet product, EtherCard Plus, a year ago, and we estimate that we're currently the No. 2 Ethernet board supplier. We think we can do a better job in hardware manufacturing than most of the competition because of our manufacturing economy of scale and the fact that most vendors don't build their own LSI [large-scale integration] chips. This month we began volume shipments of our Micro Channel Ethernet products.

Who's your main competition?

Clearly, it's 3Com. They're currently shipping more Ethernet products than we are. But in the past year, we've come from nowhere to challenge them in both Ethernet and Starlan board markets. Novell and 3Com do what they do very well — software and systems — and WD focuses more on networking hardware, so in that sense we don't really compete with them.

Do you have a profile of a typical WD end user?

There are basically two main types of users who buy our products. The first is the MIS manager in a Fortune [1,000] corporation who's responsible for the installation and support of the large corporate LAN. The second user category is the owner of a small business who's using a local PC network to implement a multiuser application such as accounting. Our network products are most often used to support small LANs and small work group networks within large corporate accounts.

Will you offer support for Apple Computer, Inc. networks?

It's not in our immediate plans. Until very recently, Apple didn't have open systems, and that's made it difficult to develop standard products for that market.

That's changing now. As far as WD is concerned, it's simply a question of priorities. We're looking at support for Apple, and we'll eventually get to it. Right now, though, the PC XT bus and the Micro Channel represent the greatest market opportunities for us.

Where does WD fit into the overall local networking marketplace?

Fundamentally, our strengths are in the hardware portion of the business and will remain so. We intend to cooperate with the LAN systems and software suppliers, such as Novell, 3Com and Microsoft, by ensuring that our hardware products operate in all of those environments.

Generally speaking, hardware has become a commodity item, and most of the attention is focusing on software. Novell, for instance, has said that it will move from being primarily a hardware vendor to a software vendor by 1990. What are the trends in networking hardware?

It's true that hardware is being relegated to commodity status, but there is still room for expansion and improvement in the hardware side of the business.

In addition, the 10BaseT 10M bit/sec twisted-pair standard has caused the industry to take a second look at twisted pair, and there's substantial room for advances in this area. Ten megabit per second twisted-pair concentrators — which are analogous to hubs for Starlan networks — currently cost about $3,000, and if you consider that our present Starlan hub costs $495, you can see that there's a lot of room for price reduction on the 10M bit/sec twisted-pair offerings.

Another trend we see is the migration to the 16M bit/sec token-ring network as a work group product. A third development is, of course, the forthcoming [Fiber Distributed Data Interface]. If FDDI's cost per node nears the cost of the current network adapter, or about $400 per node, it will allow us to look at networking in a completely different way.

There's an old adage that says, 'If a quantitative difference is great enough, it will lead to a qualitative change.' What this means is that networks will no longer be looked upon as a lot of individual computers but rather as a single resource.

For example, a low-cost FDDI product will permit system manufacturers and software developers to do completely new things in computer communications. Distributed applications will no longer need to be concerned with where a process is executed on the network.

In the future, users will be able to share graphics and image data bases with the same efficiency that they now share text data bases. Driving down network costs concurrently with price reductions in workstations — made possible by the 386-based technology — will be the foremost factor in making that ability accessible to more users.

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

> "MAP has arrived. Now vendors are coming out with products for the standard. Version 3.0 gives users the functionality they've wanted for years."

William Riker
Senior project engineer
Advanced engineering staff
General Motors Corp.

Association Watch

The **National Retail Merchants Association** will hold a one-day seminar on **Universal Price Coding and Electronic Data Interchange** (EDI) in the retail industry on Aug. 3 in Chicago.

Discussions will focus on topics such as how bar coding helps firms operate more efficiently and how to enlist the support of manufacturers in EDI schemes.

Speakers include users such as Fred Asher, vice-president with Dayton-Hudson Corp. department stores; David Carlson, vice-president of corporate information systems at K Mart Corp.; and Ray Heflin, manager of retail electronic services at Dillard Department Stores, Inc.

For more information, contact the association at (212) 244-8780.

The **American Bar Association (ABA)** is sponsoring a panel discussion on legal issues in electronic messaging systems and data interchange as part of its summer meeting in Toronto.

The discussion is scheduled for Aug. 7. Panelists include Anthony D'Anna, former chairman of the Accredited Standards Committee X12; James Geraghty, general counsel to the National Council on International Trade Documentation; and Marshall Spence, president of the EDI-Council of Canada.

For more information, contact Michael Baum at (617) 661-1234. ◼

GM study finds MAP networks cost less

In a few years, MAP networks have gone from expensive to economical, GM's Riker says.

By Barton Crockett
Senior Writer

WARREN, Mich. — William Riker claims that his faith in Manufacturing Automation Protocol has been vindicated.

For years, the soft-spoken Riker, a senior project engineer with General Motors Corp., has promoted MAP within GM as a way to cut network costs and improve management. Riker is one of four top managers in GM's corporate MAP project, which was led by MAP pioneer Michael Kaminski and is headquartered here.

Early this year, Riker and his staff completed a study that he said proves MAP nets are less expensive than vendor-specific networks.

The study found that a typical GM plant now pays, on average, $2,928 per connection on a factorywide MAP net, compared to $3,582 per connection for a proprietary network. A few years ago, however, that was not the case.

According to Riker, when GM first started using MAP in 1985, it paid dearly — almost $8,000 per network connection vs. just under $2,000 per connection for proprietary networks.

Vendors used this cost differential to promote their own proprietary systems while bashing MAP.

Now Riker said he has the numbers to respond to those critics.

"Sure, we took a beating [on MAP] in the early days," Riker said. "But we had faith. Now that investment has paid off. MAP gives us the means to gain a competitive advantage. We have all the MAP experts here in GM. Our competition has to play catch-up, if they even try to catch us at all." Riker's staff compiled the numbers by looking at typical MAP and non-MAP network architec-

(continued on page 30)

GUIDELINES

BY ERIC SCHMALL

'Groupthink' blights the decision-making process

The telecommunications manager is livid, as a newly installed private branch exchange goes into an uncontrollable electronic seizure for the fourth time in as many days since cutover. "How could we have been so stupid?" he asks.

The decision to proceed with this particular PBX was the result of careful analysis, months of negotiations and innumerable meetings of the most talented technical people in the organization. Now it appears that, in spite of all the executive expertise and mutual agreement, several early warning signs concerning the PBX's reliability were duly noted but never given much serious attention.

Interviews with some users had shown some disappointing reports on the PBX's reliability. But the price of this switch was so attractive, and everyone knew the senior staff had a special affinity for the PBX's manufacturer.

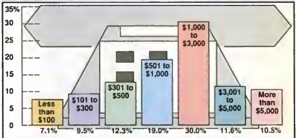
The reliability factor receded into the background: There wasn't really a representative sample of user opinions, and the manufacturer could explain away every bad user experience as wildly inaccurate or politically motivated. Now, however, as PBX failures become a daily event, the manager has no time to analyze what went wrong with the decision-making process.

The manager was a victim of "groupthink." This term was coined to describe instances in which bad decisions are made in spite of the assembly of the best and brightest minds. In contradiction to the adage that "two heads are better than one," psychologist Irving Janis pointed out in his work *Victims of Groupthink* several instances in U.S. political history where this syndrome crippled national group decision-making. He

(continued on page 30)

Schmall is network systems manager for an insurance holding company.

Monthly long-distance bills



▲Percentage of respondents reporting expenditures in each range
Figures are based on surveys of more than 300,000 sites with 50 or more telephones.

SOURCE: FOCUS RESEARCH SYSTEMS, WEST HARTFORD, CONN.
GRAPHIC BY SUSAN SLATER

Centrex users groups link users, CO switch makers

For both, growing Centrex complexity at issue.

By Barton Crockett
Senior Writer

Raleigh, N.C. — Centrex users groups have been around for years, but recently they've taken a new bent. Two newly formed groups focus on fostering dialogue between end users and manufacturers of central office switches to help them cope with the growing complexity of Centrex service.

The newly formed DMS-100 Meridian Digital Centrex User Forum held its first meeting ever last month near Northern Telecom, Inc.'s headquarters here. And late last year, the 2-year-old 5ESS User Group opened its ranks to Centrex users, who now make up about half of the group's 80 member companies.

"As Centrex service gets more complicated, end users need to have a better dialogue with the manufacturer," said Gus Bender, a member of the 5ESS User Group and second vice-president of telecommunications at The Travelers Corp. in Hartford, Conn.

Arthur Fields, president of the DMS-100 users group and project manager with the World Bank in Washington, D.C., concurred, saying that opening a dialogue between manufacturers and Centrex users is his group's most important function.

"Basically, we want to talk to the people most responsible for our product and not just work through the telcos," he said. "This group is based on the premise that we all must work together or we all fall."

Of the approximately 180 people attending the DMS-100 group's first meeting, Fields said nearly 100 were end users, about 45 came from carriers and the rest worked at Northern Telecom. Fields said this mix helped foster town hall-type discussions about new features users wanted as well as the problems they are having with current service.

In Fields' opinion, this kind of group represents a radical leap forward in the evolution of carrier services in this country.

"In the past, you just bought whatever the telco supplied to you, no questions asked," he said. "Having end users communicate directly with the switch manufacturer breaks down communication barriers that have existed for years."

At least one user said he benefited from the whole affair. Robert Bursick, director of telecommunications at Wayne State University in Detroit, said he followed up on contacts made at the DMS-100 meeting to help alleviate a service problem.

> Late last year, the 5ESS User Group opened its ranks to Centrex users.

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"I looked up the business card of a top Northern executive that I met, called him and talked about the problem," he said. "While it has yet to be fixed — I only talked to him a few days ago — I feel that making this kind of personal contact with the person who makes your switch is invaluable."

Richard Jenifer, president of the National Centrex Users Group, says he believes that such switch-specific groups are a natural extension of his own group's activities. "With the number of central office switch vendors expanding the way it is, there is no way our group can satisfy everyone," he said. "In the end, this can only benefit the user." ◼

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Vendor presence looms large on standards bodies

Users say a lack of time and money prevents greater participation in standards development.

By Paul Desmond
Staff Writer

Users and others involved in the standards-making process agree that it takes a considerable amount of time and money to participate regularly on a given standards body. Because vendors have more of these resources than most users, observers point out, vendors dominate standards committees.

According to Harold Folts, president of consulting firm Omnicom, Inc., in Vienna, Va., a person involved in standards work must attend roughly six one-week meetings per year within the U.S. and take in two weeks of international travel each year. Folts has been involved in standards for 15 years.

"It can take half a person's life away if they're really dedicated, as opposed to just rubbernecking," Folts said.

He said it is difficult to find users on standards committees, except for federal government employees, who, he said, regularly attend standards committee meetings.

Some observers said vendors have a more immediate interest in the work done on standards committees since it can affect product development. John Day, a senior consulting engineer for Codex Corp. and chairman of the Open Systems Interconnection Architecture Committee in the U.S., ANSI X3T5.1, said he spends about 30% of his time on committee work.

"Participating [on standards committees] gives firms a chance to get information up front and look after their market interests," Day said.

Tom Boos, general manager of architectural design and control for Control Data Corp. (CDC) and a member of the board of directors of the Corporation for Open Systems (COS), said about eight people at CDC spend roughly a quarter of their time working on standards. Boos said that if CDC were not involved with standards, it would put them 18 months to two years behind the competition in developing new products.

Although COS is not a standards committee, it is involved in promoting the International Standards Organization's OSI network model and Integrated Services Digital Network standards, as well as compliance tests for those standards.

John Stenske, manager of ASAP systems for Baxter Healthcare Corp., a health-care product manufacturer in Deerfield, Ill., said his firm is a member of the ANSI X12 committee, which deals with standards for electronic data interchange (EDI).

Until about six months ago, Stenske was his firm's representative to that committee. He spent about 10% of his time on committee work.

Stenske said working with the committee was a good way to keep abreast of changes in current standards and in the development of new standards.

Paul Daubitz, president of consulting firm Associated Telemanagement, Inc. (ATI), in Newburyport, Mass., said standards committees could benefit from the involvement of more people like Stanske because the groups are now dominated by manufacturers and distributors.

"We probably wouldn't have three or four [IEEE] 802 standards if users had more say," Daubitz said. The IEEE 802 standards deal with local networks.

Daubitz said the committees could also benefit from the insight of more consultants and academic people. However, Daubitz said, it is difficult for these people to participate in the standards-making process because of the expense and time involved in traveling to and attending the meetings.

"I'm not crying; I'm just telling it the way it is," Daubitz said. "It would be nice if a lot of people participated other than vendors."

E.I. du Pont de Nemours and Co. of Wilmington, Del., is one user company that was involved in standards work through COS but withdrew from that organization late last year, saying COS had changed its focus and was not responding to user needs. Du Pont spokesman John Wheeler said COS had been focusing too much on developing testing tools for standards, which Du Pont considered the least important of COS' objectives.

Process is never-ending

The standards-drafting process is a never-ending one. Earl Bass, vice-president of the Gaithersburg, Md.-based software firm EDI, Inc. and chairman of ANSI X12, said ANSI currently maintains 8,500 standards.

His committee revises its EDI standard about every six months. Since its last revisions were published in February, Bass estimated that 300 changes have been made, many of which are additions. "There's no way [the standard] can stay stagnant. Business requirements constantly change and you have to change with them," Bass said. "It's truly a living standard."

Omnicom's Folts agreed that work on standards has grown dramatically over the last decade. "I guess there are meetings going on every week someplace around the world, whereas 10 or 12 years ago, I could keep track of everything in the whole area of data communications single-handedly," he said. "And now one person can't keep up with one committee, much less several."

The increased focus on standards has already aided users, according to Folts. He said the Enterprise Networking Event '88 International in Baltimore last month showed that vendors are serious about OSI and that users are interested in buying OSI-compatible products.

But Daubitz of ATI cautioned users against letting vendors control standards issues. "If the industry folks dominate them, then their self-interests dominate, not the user interests."

Groupthink blights process

continued from page 27

cited such disastrous foreign policy decisions as the Bay of Pigs invasion and the escalation of the Vietnam War.

Communications professionals — as key players on decision-making teams — should be aware of this process, which fouls the gears of rational selection.

Groupthink is largely rooted in the fact that groups create their own reality. People are susceptible to a psychological herding instinct once they become members of a group. They generally don't want to risk irritating others or stirring up resentment.

As a consensus begins to form toward a chosen alternative, there is a powerful human urge to get on board. Group members who have misgivings about the choice not only become reluctant to betray their differences with others, but also begin to minimize to themselves the importance of their own doubt. Consequently, members with very valid concerns begin to repress them.

A second but equally pernicious characteristic of groupthink involves the group's relationship with a top decision maker. If senior staffers have already indicated what decision they would like recommended from the task force, the group will be powerfully motivated to comply, while trying to maintain the appearance of an independent, rational selection process.

Groupthink can be prevented. As leaders of decision-making groups, telecommunications managers must stay aware of the task force's atmosphere. They should encourage free and open debate. They should promote discussions on unpopular topics that seem to block consensus.

Leaders need to stir up the participants. Managers who can recognize and respond maturely to this behavior will minimize the chance of their organization succumbing to this malaise.

GM engineers work in the company's carrierband MAP laboratory.

Study finds MAP nets cost less

continued from page 27

tures in GM factories and calculating the cost of equipment for those networks.

The study does not measure such things as greater network flexibility, improved reliability and other so-called soft benefits attributed to MAP.

Riker contended that prices have fallen because manufacturers are achieving economies of scale from selling large quantities of MAP equipment — a situation that didn't exist in 1985.

Increased competition, a natural offshoot of open systems like MAP, also pushed down MAP costs, he explained, while keeping prices for proprietary systems inflated.

Now that the cost threshold has been crossed, Riker said that MAP networking equipment will never be more expensive than vendor-specific systems. A detailed comparison of typical GM MAP and non-MAP networks shows why.

The typical GM factory has a three-tiered communications architecture. Data moves from mainframes to minicomputers to programmable logic controllers (PLC) that operate robot arms and other devices on a factory floor.

Usually, machines from several different vendors must communicate with one another. GM's mainframes are typically from IBM. Its mid-range computers come from vendors like Digital Equipment Corp., while its PLCs are manufactured by dozens of companies.

In vendor-specific nets, data must be converted among these machines' proprietary protocols, requiring expensive hardware and software. For example, data formatted for IBM's Systems Network Architecture must be reformatted for Digital Equipment Corp.'s DECnet communications. Data must also be reformatted for use by the PLCs.

Whenever new machinery is installed, dozens of vendor-specific communications gateways must also be installed and frequently reprogrammed.

This causes several problems. Since data is converted frequently, the transmission error rate is high. It is also difficult to isolate network problems. Reconfiguring the network becomes a time-consuming, daunting task.

MAP networks eliminate this complexity. By installing standard MAP communications cards or controllers on factory computers, these machines can communicate directly with one another. GM also installs MAP gateways, or bridges, to move data between different kinds of MAP cable, such as carrierband to broadband, or broadband to fiber.

The relative simplicity of MAP is illustrated by the number of different communications devices needed in each of these environments. Factories built on vendor-specific networks typically need more than 10 kinds of protocol converters or gateways to move data from a mainframe to a PLC, according to Riker.

> Users find it much easier to manage MAP nets. And since simpler networks tend to reduce bottlenecks, GM's William Riker claimed that data in MAP nets moves faster.

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MAP factories typically use one or two gateways to move data between different kinds of cable and one standard MAP communications card for each of its computers.

The result, in Riker's opinion, is that users find it much easier to manage MAP nets. And since simpler networks tend to reduce bottlenecks, Riker claimed that data in MAP nets moves faster.

The upshot of this greater simplicity, Riker added, is that MAP's cost edge is likely to increase in the foreseeable future.

"If you buy one vendor-specific LAN, you have to buy nine other devices to communicate with the mainframe," he explained. "Logically, that has to be, and will remain, more expensive than MAP."

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

See inside for:

- Telebit's IBM Micro Channel-compatible modem
- A net management system from TeleSciences
- Wang and Apollo's terminal-emulation pack
- Three new versions of AT&T's CompuLert

First Look

Enhancements for Centaur II Mini debut

DataVoice Solutions Corp. recently announced enhancements to its **Centaur II Mini** business computer system that more than double its storage and processing capacity.

The Centaur II Mini allows ASCII terminals to run MS-DOS programs under Novell, Inc.'s Advanced NetWare Version 2.11 operating system. It supports 28 simultaneous terminal users, 628M bytes of disk storage and an optional Intel Corp. 80386 file processor.

The previous version supported 14 simultaneous users and 133M bytes of disk storage. Running under Advanced NetWare Version 2.0a, the existing system is based on an 80286 microprocessor.

Centaur II lets users retain access to existing hosts while working with MS-DOS programs. IBM Personal Computers and Personal System/2s can be attached via token-ring, Ethernet or Arcnet links or by using terminal-emulation software.

The increased terminal capacity is the result of a new four-port application processor card that is now offered in addition to the previous one-port card.

Each four-port card supports four terminals, whereas the one-port card supported a single terminal. Both cards can be mixed on the same system.

In addition, users can now choose between the previous 80286-based file processor card or the new 80386 card, which offers 16M bytes of memory.

In addition to the existing

(continued on page 32)

Mainstream error-fixing coders bow

By Jim Brown
New Products Editor

SALT LAKE CITY — Mainstream Data, Inc. last week introduced an encoder and a decoder that add forward error-correction capabilities to point-to-multipoint networks used to support real-time applications.

The FEC-1000 Series Forward Error Correction Data Processors are aimed at users that provide information services such as stock quotations. The data processors employ a proprietary error-checking algorithm to replace modem- and multiplexer-based error-correction schemes that require retransmission of bad data.

The retransmission technique introduces delays that are unacceptable in nets that simultaneously broadcast data from one site to multiple sites, the company said. The products work with two-wire analog leased-line modems and satellite modems operating at up to 19.2K bit/sec.

The encoder receives asynchronous or synchronous data from a host computer port or a stand-alone statistical multiplexer via RS-232 at up to 19.2K bit/sec. It wraps that data in packets ranging in size from eight to 500 bytes. Also, it includes instructions that the receiving decoder uses to determine if errors have occurred and what must be done to correct them.

That packetization reduces synchronous data throughput by about 12%. The throughput for asynchronous data is not affected because the error-correcting instructions are used in place of asynchronous start and stop bits.

Once created, the data packets are forwarded to the modem, which broadcasts them to the remote site. The remote-site modem passes the data to the FEC-1000 decoder. If the decoder

(continued on page 32)

Videophone system sends digitized video, graphics

HOUSTON — Videophone, Inc. recently introduced a system capable of transmitting digitized video images and graphics via dial-up lines at up to 18K bit/sec.

The company's IBM Personal Computer-based Videophone system enables users to transmit digitized still images or graphics in either point-to-point or multipoint mode. The system enables engineers and architects at remote sites to review and change design plans.

The Videophone system requires a separate dial-up line to support voice communications between sites.

The system consists of a Personal Computer, a color monitor, a camera, a graphics stand, a Telebit Corp. TrailBlazer modem operating at up to 18K bit/sec and an electronic pen and tablet.

The camera and electronic pen and tablet are tied to the Personal Computer through one of two add-on boards using standard connectors. Images photographed by the camera are digitized by that board for display or storage on the Personal Computer. Each image requires roughly 102K bytes of storage.

The other Personal Computer board uses a compression algorithm that creates shortened codes representing redundant image information, such as a string of identical digits representing a large black area of the image. The receiving system translates those codes and reassembles the entire image. This compression algorithm reduces the image file size and results in quicker transmission times, a company spokeswoman said.

Used in point-to-point mode, images from the Personal Computer are transmitted directly to the receiving site via the Telebit modem.

When used in multipoint mode, Videophone users must dial in to a teleconferencing bridge installed on either a central office switch or a private branch exchange. Multipoint mode also limits transmission speed to 1,200 bit/sec.

Videophone system software enables users to recall stored images from the disk, make changes to the image via keyboard commands or superimpose notes over the image using the electronic pen and tablet. That image is then transmitted to the remote site.

Remote users can likewise make changes to the image or superimpose notes to the received image and send it back.

Pricing

A Videophone system supporting Personal Computer screen images of 256-by-256 pixels costs $15,300. A system supporting higher resolution of 512-by-512 pixels costs $17,000.

Users can contact Videophone by writing to P.O. Box 14554, Houston, Texas 77221, or by calling (713) 741-1971. ■

APX Labs package links applications

ApXCHANGE allows applications on different mainframes to communicate and share data.

By Jim Brown
New Products Editor

NEW YORK — Advanced Program Xchange Labs, Inc. (APX Labs) recently announced software designed to ease the task of establishing connections between applications running on various IBM mainframes.

Released at the National Financial Computer and Automation Conference here last week, APX Labs' apXCHANGE software resides on IBM mainframes running under MVS and is designed to support IBM's Systems Network Architecture protocols. The software enables applications to communicate and share data with applications on the same system or remote processors.

When making connections between applications on the same system, apXCHANGE uses MVS' Cross Memory Services. To establish connections to remote applications, the software works in conjunction with a version of VTAM supporting LU 6.2 communications protocols.

Basically, apXCHANGE is configured to detect one application's request for data supported by another application. It then issues a series of send/receive commands to retrieve that data and transfer it to the requesting application. The software works with existing communications hardware and net configurations.

An APX Labs spokesman said apXCHANGE is designed to reduce the number of LU 6.2-based Advanced Program-to-Program Communications programs a mainframe must support in order to provide program-to-program communications.

With LU 6.2, communications programs are embedded in applications to enable them to communicate, meaning an application requiring connections to more than one other application must contain multiple sets of LU 6.2 programs.

ApXCHANGE uses what the spokesman described as a client, server and broker model to reduce the number of LU 6.2 programs.

A client is an application that requests access to computing resources supported by another application. A server is the application that supports the requested computing resource. The broker maintains a directory of servers and establishes the connection linking the client to the appropriate server.

In addition, apXCHANGE improves response time between applications, the spokesman said. The software makes use of VTAM's Large Message Performance option to establish parallel sessions between applications. Parallel sessions act much like a full-duplex connection. One session is used to send requests for data or computing services while the other is used to send responses to the requesting application.

System programmers need to specify which applications will be listed in the apXCHANGE directory. Application developers then write applications capable of linking to apXCHANGE.

APX Labs also released apXPLORE software, which works with apXCHANGE to enable a data base application to transparently access data files residing on remote mainframes.

> The software works in conjunction with a version of VTAM supporting LU 6.2.

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The apXPLORE software has two modules, call intercept and call server. The call intercept module is written into the data base application and is designed to look like the data base management system to the application.

When requests for data are issued, the call intercept module links to apXCHANGE, which connects to the DBMS maintaining that data. The call server module installed on the DBMS is designed to retrieve the requested data and send it via apXCHANGE to the requesting application.

Two versions of apXPLORE were announced. One version, apXPLORE-CICS, supports connections between CICS-supported DBMSs, while apXPLORE-IMS supports connections between IMS-based DBMSs.

Both apXCHANGE and apXPLORE are aimed at banks, insurance companies and securities firms. Those industries dedicate mainframes to specific applications, such as money market applications, which often need to access applications on other

(continued on page 32)

First Look

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floppy disk drive and 133M-byte hard disk, the Centaur II Mini now offers 318M-byte and 628M-byte hard disk drives for increased on-line storage.

Terminals can be wired directly to the application processors via standard telephone lines, or a private branch exchange can be used to increase the number of users. Using a PBX, terminals access the processor on a contention basis, allowing the system to support up to 140 terminals, although not simultaneously.

The Centaur II Mini is housed in a stand-alone 21½-in. tower but can be removed and mounted in a 19-in. rack. Additional application processors can be added.

Available now, prices for the Centaur II Mini start at about $25,000 for a five-processor configuration supporting 20 users on a contention basis.

DataVoice Solutions Corp., Suite 800, 1 Newport Place, Newport Beach, Calif. 92660, or call (714) 752-8181.

Net mgmt. system for microwave out

TeleSciences Transmission Systems, Inc. recently introduced a net management system capable of controlling networks of as many as 99 Avantek, Inc. DS3 digital microwave radios.

The **AVnet 1000** system consists of a controller board and software installed in an IBM Personal Computer XT or compatible. The system enables users to monitor any combination of Avantek 45M bit/sec radios broadcasting in the 2-GHz, 6-GHz and 18-GHz frequency bands. Those radios support voice and data transmission.

Users link the Personal Computer running the AVnet 1000 system to a central-site radio terminal via an RS-232 link. The AVnet 1000 communicates with remote sites via a 64K bit/sec channel on the microwave network. The network management system uses a polling technique to collect network status, alarm and performance reports from remote sites at regular intervals. All alarms are displayed on the Personal Computer screen in real time and contain the radio terminal name, address and time of alarm.

An optional printer can be added to the system to support automatic alarm printouts.

AVnet 1000 is scheduled to be available in August. Prices for the system will be determined by the number of radios in the network. A system to manage a typical network of 20 radios costs $43,000 and includes a one-year software maintenance agreement.

TeleSciences Transmission Systems was formed when TeleSciences CO Systems, Inc. purchased Avantek's commercial microwave transmission systems division.

Avantek continues to market microwave components and semiconductors to the U.S. Department of Defense.

TeleSciences Transmission Systems, Inc., 48761 Kato Road, Fremont, Calif. 94538, or call (415) 651-0300.

PC users get access to SNA 3270 hosts

GE Information Services recently announced an agreement that will give users with personal computers asynchronous access to IBM Systems Network Architecture 3270 hosts via GE Information Services' value-added network.

Through an agreement with **Packet/PC, Inc.** of Farmington, Conn., GE Information Services will market the **Packet/3270** microcomputer-to-mainframe link. Using the software, clients can access their own hosts as well as GE Information Services' IBM processors.

Packet/3270 gives personal computer users on a GE Information Services' network SNA capabilities for such functions as integrated file transfer, simultaneous display and printer sessions, and an IBM-compatible Applications Program Interface.

Designed for best performance on a packet-switched network, Packet/3270 combines two host interfaces. Packet/Main works with IBM's VTAM and Network Packet Switched Interface, and Packet 74 emulates an IBM 3274 cluster controller.

Prices and availability information will be out later this month.

GE Information Services, 401 N. Washington St., Rockville, Md. 20850, or call (301) 340-4000.

Pack connects Apollo workstations, Wang VS

Wang Laboratories, Inc. and **Apollo Computer, Inc.** recently introduced a terminal-emulation package that enables users of Apollo's Domain Series 3000 Personal Workstations and Series 4000 Personal Super Workstations to access Wang VS minicomputers.

Called **VS Window,** the product consists of software and a controller board that fits into an IBM Personal Computer AT-compatible slot in the Apollo workstation. The workstation is then connected to the Wang VS via a high-speed data link.

The user can install VS Window on a Domain Series 3000 or 4000 workstation in a Domain network, and any node within the network can access VS applications. VS Window supports only one communications session to the VS minicomputer at a time.

With VS Window, Apollo users gain access to the electronic-mail and time-management functions of VS Office, Wang's office software for VS minicomputers. Users also gain access to data base applications using Pace, Wang's application development and information management environment, as well as Wang Word Processing and WP Plus document processing programs.

VS Window uses icons, a mouse and pop-up menus to enable Apollo users to interact with Wang applications.

The VS Window package is available now from Wang at a price of $1,800.

Wang Laboratories, Inc., 1 Industrial Ave., Lowell, Mass. 01851, or call (508) 459-5000.

PC-based twinaxial data analyzer out

Azure Technologies, Inc. recently unveiled an IBM Personal Computer-based protocol analyzer that captures data from twinaxial links between IBM 5250-type terminals and IBM System/34, System/36, System/38 and AS/400 minicomputers.

TwinaxScope's menu-driven applications and function keys enable users to capture and record up to 16M bytes of protocol data from twinaxial lines. Users can search that stored protocol data for specific errors or use a windowing feature to display recorded data and acceptable protocol sequences side by side.

The TwinaxScope is available immediately at a price of $3,995.

Azure Technologies, Inc., 38 Pond St., Franklin, Mass. 02038, or call (508) 520-3800.

AT&T's three remote system monitors bow

AT&T Network Systems Group recently introduced three smaller versions of its **CompuLert** computer administration and maintenance system.

Introduced in 1985, CompuLert lets data center managers use one AT&T minicomputer to monitor local and remote ASCII devices such as terminals and other computers. It also lets users determine such environmental conditions as the temperature of a remote computer center.

Like the original CompuLert system, the three new systems provide access to any ASCII device through dedicated or dial-up lines. The smallest system runs on either the 3B2/400 or 3B2/600 minicomputer and can monitor up to 10 remote devices. The second system uses the same hardware and can monitor 20 remote devices. The third system runs on a 3B2/600 computer and can monitor up to 64 remote devices. The initial release of CompuLert consists of a 3B20D minicomputer and software.

Prices of the four CompuLert systems range from about $50,000 to $400,000. They are available now.

AT&T Network Systems Group, 475 South St., Morristown, N.J. 07980, or call (201) 631-6000.

Telebit modem for Micro Channel-based PS/2s out

By Jim Brown
New Products Editor

MOUNTAIN VIEW, Calif. — Telebit Corp. last week introduced an IBM Micro Channel architecture-compatible version of its TrailBlazer modem for IBM Personal System/2s based on the Micro Channel.

When communicating with other TrailBlazer modems, the new TrailBlazer Plus PS supports asynchronous transmission speeds up to 19.2K bit/sec over dial-up lines. The modem can be used with Personal System/2 Models 50, 60, 70 and 80.

As with other Telebit modems, the TrailBlazer Plus PS uses Telebit's Packetized Ensemble Protocol (PEP) to achieve the 19.2K bit/sec speed over dial-up lines. That protocol splits the bandwidth of a dial-up line into several data channels, each of which is capable of supporting data transmission.

TrailBlazer Plus PS will automatically adjust its speed to work with existing PEP-compatible modems operating at 19.2K bit/sec or 18K bit/sec. TrailBlazer Plus PS can adjust its modulation technique to communicate with CCITT V.22bis-compatible modems at 2,400 bit/sec, V.22- and Bell 212A-compatible modems at 1,200 bit/sec, and Bell 103J-compatible modems at 300 bit/sec.

When used at high speeds, TrailBlazer Plus PS will support the error-checking scheme included with PEP. At lower speeds, it will support the error-checking scheme included with Microcom, Inc.'s Microcom Network Protocol.

When operating in PEP mode, the TrailBlazer Plus PS will drop its speed in increments of 100 bit/sec in response to worsening line conditions. The new modem can also be down-line configured, and it supports remote diagnostics.

TrailBlazer Plus PS is available alone or bundled with Hilgraeve, Inc.'s HyperACCESS data communications software. That software supports a data compression algorithm that enables the modem to achieve an effective throughput of 49K bit/sec.

The price for a TrailBlazer Plus PS with the HyperACCESS software package is $1,295, while the cost without the software is $1,195.

Telebit can be reached by writing 1345 Shorebird Way, Mountain View, Calif. 94043, or by calling (800) 835-3248 or (415) 969-3800.

APX pack links applications

continued from page 31

mainframes, such as a mutual fund application.

The license fee for apXCHANGE running on an IBM 3090 is $78,000. The license fee for apXPLORE-CICS or apXPLORE-IMS running on an IBM 3090 is $22,000. Both apXCHANGE-MVS and apXPLORE-CICS are available now, while apXPLORE-IMS is entering beta test sites and is scheduled to be available by August.

APX Labs is working on versions of apXCHANGE capable of running under IBM's VSE and VM operating systems.

The company is also developing versions capable of linking applications on Digital Equipment Corp. VAX minicomputers, OS/2 and Unix-based microcomputers to applications on an IBM mainframe.

Future releases of apXPLORE will support connections between IBM IDMS, DB/2 and SQL/DS DBMSs.

APX Labs can be reached by writing 1 Apple Hill, Suite 300, Natick, Mass. 01760, or by calling (508) 651-0099.

Mainstream coders bow

continued from page 31

detects an error in transmission, Mainstream Data's error-checking algorithm determines which bits have to be changed in order to correct the error.

The decoder is capable of correcting from one to 32 consecutive bytes. If more than 32 consecutive bytes are in error, the packet is destroyed. That action requires a replacement packet to be sent at a later time.

Corrected packets are passed via an RS-232 line to the end user's data terminal equipment (DTE) or to a statistical multiplexer supporting multiple pieces of DTE.

FEC-1000s use Intel Corp. 80188 and Motorola Corp. 68HC11 microprocessors, and each unit supports 64K bytes of erasable programmable read-only memory and 256K bytes of random-access memory.

FEC-1000s also track performance statistics such as the number of packets transmitted, the number of bytes corrected and the number of blocks that were destroyed because they had more than 32 consecutive bytes in error. Those statistics are displayed on the unit's front-panel LCD.

Available in stand-alone or rack-mountable versions, each FEC-1000 encoder or decoder costs $1,895.

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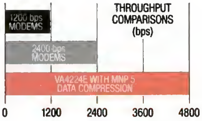

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OPINIONS

USER TRAINING

CHUCK PATTERSON

Shortcuts in training are shortsighted

Andres Llana Jr. was on target when he pinpointed low profit margins as the reason for shortcut solutions by vendors when training customers on sophisticated telecommunications systems. But his column, "The need for user training is greater than ever" (*NW*, May 2), failed to point out other reasons why providing training as an afterthought is a profit-limiting, myopic approach to the marketplace.

Inadequate training reduces the rate at which the market can expand by increasing both the cost of ownership to the user and the cost of support borne by the vendor. Thus, good customer training makes good business sense, particularly in a multivendor environment.

Good training begins with product design. For support personnel to be effective, software interfaces must be readily intelligible to the user, and the screens must be concise and descriptive. Nomenclature must also remain consistent from one software release to the next. The same is true for product documentation.

Training documentation must clearly define procedures for installation, fault isolation and remedial action. Well-defined procedures can often be incorporated into a self-study format. When training issues are considered in the early stages of product design, the user's time away from the job can be minimized.

> Client organizations will have an increasing need for access to quality training.
>
> ▲▲▲

The smart vendor will also invest in a hands-on approach to training when appropriate, installing all necessary equipment in each classroom. This ready access to equipment permits lectures to be immediately reinforced and shortens the time required for students to master new concepts. To be effective, class sizes must be limited to ensure that each student receives the hands-on time necessary to perform required tasks with confidence.

This type of training can be done only in a controlled laboratory environment dedicated to training. Wise customers are wary of vendors that attempt to conduct on-site training in a live network environment using whatever equipment happens to be on hand. The price of this afterthought approach to training can be quite high when poorly trained students take down a network because they weren't able to practice procedures in class.

The payback for investing in effective hands-on training is ongoing. Customers who receive good training can minimize conversion and installation costs and get an earlier return on their investment. Confident users become inside salespeople, more willing to identify and sell new applications within their organizations. Effective training can also reduce finger-pointing and downtime. And it can reduce the pressure on the vendor's field service and technical assistance organizations.

A vendor's ongoing investment in curriculum development and in classroom facilities underscores its commitment to the principle that good training enhances profit margins for both the vendor and the user. As digital networks become more prominent in the marketplace, client organizations will have an increasing need for access to quality training.

Recognizing this, the more sophisticated customers often enroll personnel in various vendors' classes to evaluate the quality of training as a routine part of their vendor selection process. Thus good training gives the smart vendor an even greater competitive edge.

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EDITORIAL

Central office fiascos expose user vulnerability

The now infamous Hinsdale, Ill., central office disaster and the less spectacular but equally unsettling Framingham, Mass., fiasco highlight the need for corporate network users to press carriers to define exactly how they are accountable for service outages.

This much is clear: Users can no longer presume central office switches are infallible. Nor can they blindly assume that telephone companies are adequately prepared to contend with disasters, natural or otherwise.

The issue was brought to the fore in May when a fire destroyed an Illinois Bell Telephone Co. central office switch in Hinsdale, one of the carrier's three largest switch hubs. Roughly 35,000 local business and residential users lost service, some for weeks.

Two weeks ago, crewmen knocked out a New England Telephone and Telegraph Co. central office switch in Framingham by disabling the wrong 600-amp fuses. The blunder, which kept the switch out of commission for most of the business day, affected 35,000 customers, including many large firms headquartered in the sprawling metropolitan area 20 miles west of Boston.

Taken together, the disasters have effectively exposed a longstanding but once inconceivable vulnerability. As one telecommunications manager affected by the Framingham outage lamented, "My contingency plan accounts for everything but a central office failure."

Indeed, the very nature of the two incidents points out the extent of the vulnerability. Switch failures can be catastrophic, as in the Hinsdale fire, or, at the other extreme, as simple as the human error that crippled the Framingham switch.

If the Hinsdale fire wasn't enough to get network managers to review their dependency on specific carrier switches, the Framingham incident should provide new impetus. Companies should be examining, among other things, the benefits of route diversification, which is the practice of supporting business sites from more than one central office, sometimes with more than one carrier.

And some users should take a fresh look at bypass systems, this time calculating the payback with a line item for business security. How much is it worth to your business to have an alternative way to access your long-haul carrier if the local central office switch blows up?

Most importantly, users should meet with their carriers to carefully detail what they are accountable for and what type of contingency plans they have. Discussions of accountability are likely to be eye-opening because precious few carriers are willing to be held responsible for service availability.

But like it or not, carriers may be more accountable than they think. Many of the customers affected by the Hinsdale fire are suing Illinois Bell for damages. The outcome of those suits will affect the willingness of carriers to discuss accountability with their own customers.

It may be equally eye-opening for users to examine carrier disaster plans for central office switches. The Hinsdale switch, for example, wasn't manned around the clock. The fire smouldered for hours before it was even reported. And like most central offices, the Hinsdale switch had a passive fire protection system — a system of fire walls — not a halon fire suppression system like those used to protect most corporate computer systems.

Users need to press carriers for information, such as what percentage of lines they are prepared to back up in an emergency and the order in which service would be restored — who gets what and when, and what factors influence that decision.

Users might also want to see if their carrier has a plan to deal with catastrophic switch losses. Northern Telecom, Inc., for example, has installed entire central office switches in truck trailers that can be brought to its telephone company customers within a day or two, in the event of disaster.

Although it can be argued that the Hinsdale and Framingham outages were isolated events unlikely to crop up again anytime soon, too many of today's network applications are too critical to let it go at that.

"If this happened last week, it can happen again," one Framingham network manager said after that switch failure.

OPINIONS

MODIFIED FINAL JUDGMENT

ALAN PEARCE

The Huber Report — missing and presumed dead

Whatever happened to the Huber Report? And will there ever be another?

These are the questions buzzing around Washington, D.C. public policy-making circles this year as the telecommunications/information industry readies itself for the second triennial report on the impact the Modified Final Judgment has had on the regional Bell holding companies.

When the AT&T antitrust suit was resolved with the breakup of the old Bell System on Jan. 1, 1984, U.S. District Court Judge Harold Greene, who heard the antitrust suit, wrote into the Modified Final Judgment a requirement that a report, to be prepared by the Justice Department, would be submitted to him every three years. That report would study the Modified Final Judgment's impact on the RBHCs' business operations.

For the first report, delivered to Judge Greene in February 1987, the Department of Justice hired a consultant, Peter Huber, to help frame the recommendations to the judge. The so-called Huber Report was anxiously awaited, was widely read when it appeared and has since been generally ignored.

Based on Huber's report, the Justice Department recommended that Greene lift or relax line-of-business restrictions imposed on the Bell operating companies by the Modified Final Judgment. Indeed, the only restriction that would have remained had the Justice Department had its way was the one preventing the BOCs from entering the long-haul services mart.

Now the time is approaching when preparations should begin for the second triennial report, which was originally scheduled to be delivered on Jan. 1, 1990. Will there be another Huber Report? When will it be submitted to Greene?

Barry Grossman, chief of the Communications and Finance Section of the Antitrust Division of the Justice Department and the man responsible for overseeing preparations for the second triennial report, says, "The Department of Justice has already recommended that Judge Greene extend the due date for the second triennial report so that it would not be three years from January 1987, but from some later point. With the appellate review process, we might not know what the final word is on the first triennial report until 1989.

"The Justice Department believes that there might be substantial public benefit in getting some experience with one set of rules before starting up the triennial review again," Grossman says. "This is why the department has asked the judge for a postponement. I don't know what he is going to do with our idea on that. I don't know whether he has purposely not responded or whether it just got lost among the substantive issues that he's been forced to deal with. In any event, we at the department have not spent a great deal of time worrying about the second report."

> Will there be another Huber Report? When will it be submitted to Judge Greene?
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One obvious reason why the Justice Department is not worrying about the second report — apart from the fact that the judge may decide to delay it — is the presidential election this fall. By next January, there will be a new president, a new attorney general, a new assistant attorney general in charge of antitrust matters and the Modified Final Judgment, and perhaps many other new people at the Justice Department.

Another, though perhaps less obvious, reason for the Justice Department's lack of concern is the general reaction to the department's recommendations that accompanied the Huber Report in early 1987. Both Greene and the industry at large ignored the report and the recommendations. In effect, very little has changed.

Judge Greene clearly had his reasons for ignoring Huber and the recommendations. Greene, a liberal Democrat, believes that the Federal Communications Commission, under Republican leadership, was being soft on its regulatory responsibilities. He has said so repeatedly.

Consequently, say some insiders, he wanted to keep control over the Modified Final Judgment rather than trust the right-wing political leadership at the FCC.

While retaining control over the Modified Final Judgment, Greene has constantly reminded the FCC that it is supposed to be regulating the industry according to the Communications Act of 1934, as opposed to "unregulating" it, which is what the last chairman, Mark Fowler, attempted during the six years that he was head of the agency.

Judge Greene's tactics are beginning to pay off. Dennis Patrick, the current FCC chairman, has been a more rigorous regulator than Fowler since he took over last year in April. Many Capitol Hill staffers believe that Greene has played a vital role in the FCC's new regulatory vigor. Says one staffer: "It's as though Chairman Patrick is attempting to prove the judge wrong by doing exactly what the judge wants him to do — regulate effectively. It's wonderful!"

The question still remains: Is another Huber needed for the second report?

"It is not clear to me that we necessarily have to follow that route next time," Grossman says. "It would be somewhat premature to be paying a consultant. But certainly, if we can find somebody who is close to Huber's abilities, we'd be most fortunate."

The next "triennial" report may become a footnote in the mathematics textbooks of the future, largely because it won't be submitted to Greene until some time after Jan. 1, 1990. Not only might Greene go along with the Department of Justice, which has already asked for a delay, but this fall's presidential election and the subsequent changes in the Washington policy-making leadership virtually mandate postponement.

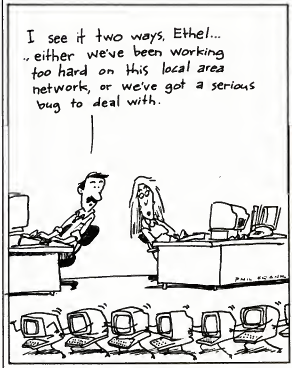
Only in America could "triennial" be operationally defined as longer than three years. But those working in the telecommunications/information industry are familiar with such paradoxes.

After all, only in America could a "final judgment" be "modified." ◼

Pearce is president of Information Age Economics, a telecommunications research firm in Washington, D.C.

TELETOONS

BY FRANK AND TROISE


I see it two ways, Ethel...
.. either we've been working too hard on this local area network, or we've got a serious bug to deal with.
PHIL FRANK

LETTERS

Demoralizing technology

The column by Roy Daniel Rosner in the June 27 issue of *Network World* ("Networking improvements can't wait for ISDN") struck a chord. However, I feel his article did not go far enough in discounting the hope that the regional Bell holding companies are generating in the Integrated Services Digital Network arena. The managerial paralysis resulting from the "futures selling" being shamelessly conducted by the RBHCs is reaching epidemic proportions. ISDN has come to mean I Should Do Nothing.

ISDN will play an important role in some major corporate networks and common carrier networks. However, the old adage that 80% of your business comes from 20% of your customers, if true, leaves 80% of American companies sitting on the sideline watching the "biggies" wrestle with the possible merits of ISDN. In the meantime, companies that currently lack any justification for a network are delaying decisions to upgrade equipment until the ISDN-compatible key system or the multiprotocol interface adapter reaches the marketplace. Companies with 9.6K bit/sec data networks are awaiting the "technological utopia" of ISDN to solve their throughput problems,

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SNA's new look

By CLAIRE FLEIG

IBM says SNA is new and improved — but is it any more than window dressing?

IBM's early data communications environment specified as many different methods of transmitting from one device to another as there were types of terminals and processors.

Then, in 1974, IBM introduced Systems Network Architecture. SNA specified standards for host-to-terminal connections in Synchronous Data Link Control, access to information stored on the host through VTAM, and connections between the host and attached devices via Network Control Program (NCP).

In the original SNA scenario, data communications took place in environments consisting of mainframe hosts, communications controllers and dumb terminals. The host controlled every data communications transaction, making communications between terminals without host participation impossible. Each host controlled its own territory, or domain. And the situation did not change even when IBM introduced SNA Interconnect, which made it possible for multiple SNA networks to communicate.

The communications environment today is different in many ways from the one IBM faced in 1974. Users want transparent data communications among many distributed processors made by IBM and other vendors. They also want to transmit voice, images, text and graphics at a variety of line speeds.

Today's large networks are oriented toward Enterprise Networking, a term IBM uses to describe a networking strategy that encompasses all of the communications an organization needs — whether the organization is in one central location or scattered worldwide.

Notwithstanding this new networking environment, IBM is now responding to users' communications requirements in virtually the same way it did in 1974 — by giving users SNA, albeit in a repackaged and updated form. Today, SNA is often presented as virtually a new communications method.

According to many reports, peer-to-peer communications has replaced the hierarchical framework of the old SNA, making it possible to build SNA networks without host connections. A new era, non-mainframe-oriented, is about to commence for SNA users — or so the story goes.

However, the "new SNA" is not what it's cracked up to be. IBM is indeed changing SNA, but the result is likely to be more, not less, emphasis on the mainframe and the use of more, not fewer, millions of instructions per second on the host. This will occur despite the emphasis on peer-to-peer communications and despite the requirements for what is popularly known as distributed processing.

Today's hierarchical SNA requires that both programmers and users have sophisticated

Fleig is director of systems research at International Technology Group, a Los Altos, Calif.-based research and consulting firm specializing in the IBM market.

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knowledge of how it works. By contrast, the emerging "new SNA" can be called transparent because its key operations — data storage, routing, connection and reconnection of communications lines — will function without user or programmer awareness.

IBM's current emphasis on peer-to-peer communications is one of the central building blocks of the transition to transparent SNA, which will evolve as a mixture of the old and the new in which the mainframe will continue to play a leading role.

The transition from hierarchical SNA to transparent SNA, which began in 1982 with the introduction of LU 6.2 on the mainframe, can be charted through three distinct but overlapping phases.

Phase 1, peer-based SNA, lasted from 1982 to 1988 and established the capability for peer-to-peer communications.

Phase 2, extended SNA, will last from 1988 to 1991 or 1992 and will extend the capabilities of SNA, so that it can function in a multivendor environment.

Phase 3, beginning in 1991 or 1992, will establish the use of transparent SNA computing in routine communications operations.

Peer-based SNA

The restructuring of SNA began with the introduction of Advanced Program-to-Program Communications in 1982. Known within SNA as LU 6.2, APPC broadens the way that applications can communicate by eliminating the requirement that all applications be designed for the processor on which they operate.

The peer-to-peer communications stage provides the first building block of transparent SNA by eliminating host supervision of many low-level functions required for communications transmissions. Before APPC, every application had to correspond to a specific logical unit so

(continued on page 40)

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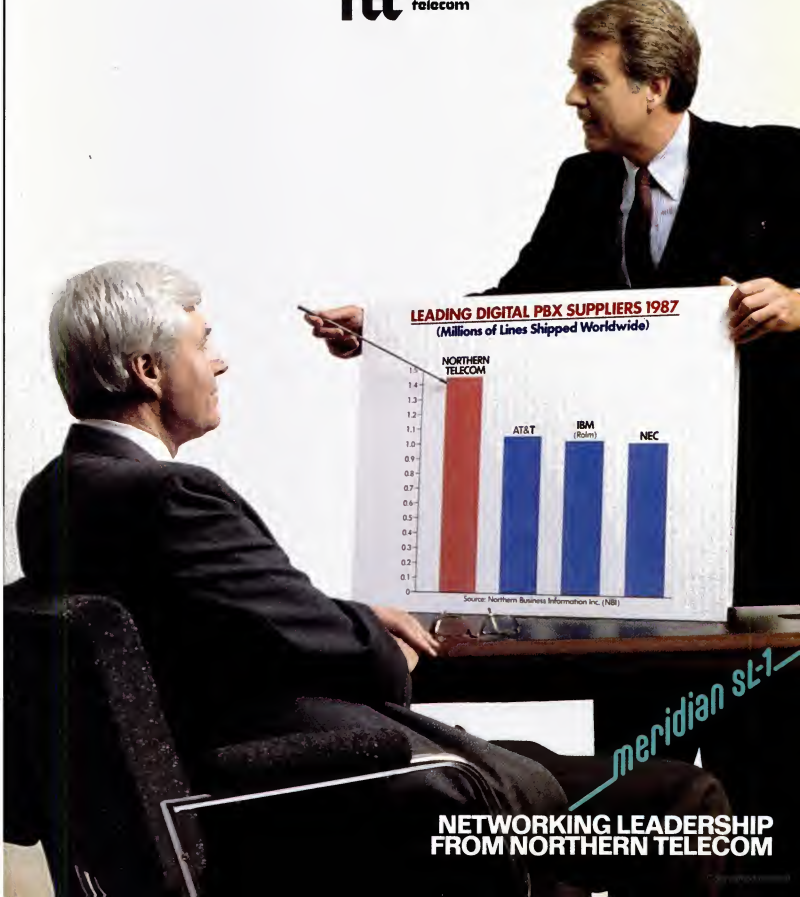
LEADING DIGITAL PBX SUPPLIERS 1987
(Millions of Lines Shipped Worldwide)
NORTHERN TELECOM
AT&T
IBM (Rolm)
NEC
1.5
1.4
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Source: Northern Business Information Inc. (NBI)
meridian SL-1
NETWORKING LEADERSHIP FROM NORTHERN TELECOM

(continued from page 37)

the network could identify which devices could communicate with one another. LU 2, for example, allowed communications between hosts and 3270 terminals. LU 3 provided for connections between hosts and 3270 printers.

With APPC, devices and programs are only required to support the generic LU 6.2 protocol for complete communications between applications. The host doesn't have to act as a host during SNA-based communications. The network will see the host as having the same capabilities for application handling as an IBM Personal Computer or System/36.

The host is still required, however, for some important tasks, principally network management and maintenance of the storage and routing tables necessary to set up and reconfigure an SNA network.

In 1984, IBM introduced another building block, PU 2.1 (renamed Node Type 2.1 in late 1987). Node Type 2.1 provides peer connectivity at the device or processor level.

In addition, it provides the basis for communications at the application level via LU 6.2.

Since 1982, IBM has been progressively building LU 6.2 and Node Type 2.1 functionality into its processors. All IBM processors and operating systems now support the protocol.

In January of this year, IBM added support for LU 6.2 to NCP in Release 5 of that software, giving its 3745 communications controller and 3725 communications control unit the ability to support APPC and Node Type 2.1.

Phase 1 of the restructuring of SNA is well on its way to completion. SNA developers now have the basic programming tools and are beginning to create new applications and to migrate existing applications to LU 6.2 and Node Type 2.1.

For example, a common programming interface to migrate existing CICS and IMS applications to LU 6.2 was introduced in November 1987.

Full peers need more

While LU 6.2 and Node Type 2.1 provide the basis for peer-to-peer connections, full peer communications require more sophisticated routing capabilities. In June 1986, Advanced Peer-to-Peer Networking (APPN) was introduced for IBM's System/3X computers. APPN enables users to communicate across a network of System/3X products without a host processor. It lets each network node act as a full partner, or peer, in the transmission of data from one point to another.

APPN also provides two important services in the SNA environment. One is dynamic routing. This lets a network almost instantly change the direction in which data traffic is moving, without user or operator intervention. It can be used to avoid network obstacles or to take advantage of lower cost connections.

The second service is a directory feature that uses the file and data base information stored in each processor to let APPN identify where requested files are stored and then plan the most efficient route to that processor. So far, this product has appeared only in the SSP operating system for the System/36.

But this implementation of APPN for the System/3X line is merely the first step. Over the next 18 to 24 months, IBM will implement APPN throughout its processor line.

Over the next 18 to 24 months, IBM will implement APPN throughout its processor line.

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Most likely, IBM will include APPN functions in the VM operating system at the mainframe level. It will probably also include it in an add-on card for the Personal Computer family, running under DOS, with an eventual interface provided for OS/2. In this way, mid-range systems, and eventually personal computers (under OS/2 Extended Edition), could act as hosts for basic communications functions.

An overlooked aspect of peer-based SNA is that, while it allows nonmainframe processors to communicate without host supervision, it also allows mainframes to communicate as peers, eliminating the clumsy SNA Interconnect programs required today.

Today, peer communications scenarios usually involve configurations of Low-Entry Networking options. Low-Entry Networking is an IBM concept related to APPN that refers to networking without a host mainframe.

However, IBM's Enterprise Networking model is too large to be handled that way. Instead, a full Enterprise Networking solution will require several mainframe peers in ongoing communications operations.

The need for transmission between mainframe peers is one of the driving forces behind IBM's emphasis on high-speed bandwidth management.

IBM's approach to high-speed bandwidth management is typified by the 3737 remote channel unit, introduced in June 1987 and enhanced in January 1988.

In addition, IBM will eventually introduce a higher speed version of its Token-Ring Network ("IBM readies 16M bit/sec Token-Ring for fall debut," *NW*, July 11). Without the capability for high-speed bandwidth management, a cluster of interconnected mainframes would be a communications disaster.

Extended SNA

Phase 2 of IBM's remodeling of SNA began in 1987 with a series of announcements: high-speed data distribution via the 3737 Remote Channel-to-Channel Unit, the Integrated Digital Network Exchange (IDNX) T-1 product line and the 9750 Business Communications System.

This pattern continued in 1988, principally with the introduction of the 3745 front-end processor. The 3745, with the capacity to run two NCPs and handle peer-to-peer communications, has set the stage for Phase 2 of SNA's restructuring. During this phase, which should peak around 1992, three new SNA configurations will become commonplace: hybrid networks, small system networks and distributed networks.

Hybrid SNA networks can handle both traditional, hierarchical SNA traffic and peer-to-peer traffic. This environment is emerging now because of the extensions IBM has made to its VTAM/NCP complex and because of architectural changes implemented in the latest generation of communications control units, the 3745.

With the implementation of peer networking support for Advanced Communication Function/VTAM and Advanced Communication Function/NCP at the host level, hybrid networks can become a real alternative to hierarchical SNA configurations. Before the VTAM/NCP enhancements, peer application and processor system support were available only at the mid-range and Personal Computer levels on the host. The new 3745 communications control unit also supports two processors and two versions of NCP.

The emerging small-system networking environment consists of a mid-range-level processor that acts in place of the host and can operate a limited SNA network environment. This environment is aimed primarily at departmental, special-purpose and remote-processing applications, with processors such as the 9370, System/3X, Series/1 and System/88 handling a subset of SNA host functions.

Small-system networking emerged in the early 1980s with the implementation of SNA processor functions in EDX on the Series/1. Between 1980 and 1986, the Series/1 was the only processor in the IBM product family that could support host functions in the network. In 1986, IBM, driven by developing peer-to-peer networking capabilities, began a serious commitment to extending small-system networking capabilities.

The evolution of this strategy calls for a range of processors under the small-system umbrella, all capable of performing some host SNA functions. Systems due to receive this capability include communications control units (which IBM now calls central control units), the Business Communication System, the high end of the Personal System/2 family and the recently released Application System/400 series of mid-range processors.

The Extended SNA phase will see the capability for tiered communications processing, in which networks of small systems operate independently of the host for most functions but have access to host capabilities for large data storage requirements and network management.

In parallel with developments in small-system networking, IBM is continuing the distributed-processing scenario created to support the 8100 environment. Since 1986, IBM has progressively extended the DSX operating environment to all of its mainframe operating systems, Personal Computers and the System/88. With the debut of NetView Distribution Manager in late 1987, distributed processing became part of the NetView complex.

The traditional SNA environment used this approach for communications between the 8100 and attached devices. In the emerging scenario, this approach will be used primarily to support host-controlled download of applications to attached devices, with or without user knowledge and control.

Hybrid SNA nets can handle both hierarchical SNA traffic and peer-to-peer traffic.

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A key element of this approach was the release of the 3174 Microcode program for NetView Asset Management. This program establishes and stores an identification number for each terminal or processor attached to the network. This identification structure allows the transmission of software upgrades to users and the dynamic reconfiguration of the network in case of problems.

Transparent SNA

The third phase of the restructuring of SNA is most likely to emerge in 1991 or 1992, when IBM should also release a new family of mainframes.

The pivotal product in this emerging environment will be Enhanced Connectivity Facilities (ECF), introduced in June 1986. ECF was initially characterized as a microcomputer-to-mainframe link for established Personal Computer formats such as Lotus Development Corp.'s Lotus 1-2-3 and Symphony, Microsoft Corp.'s Multiplan and Ashton-Tate's dBASE I and III. ECF uses 3270 data streams and LU 2 application protocols, which allows 3270 emulation by the Personal Computer. In the emerging environment, ECF will handle three major processing tasks: data access, data transformation and distribution of application functions.

The creation of an SNA that is transparent to both users and programmers requires an infrastructure of five primary components: common interfaces for programmer and user; automatic routing facilities for data storage, transmission and distribution; high-bandwidth capabilities for high-speed communications transmission; data base storage repositories; and transformation to handle the conversion from one architectural format to another.

The basis of these components has already begun to emerge. IBM has promised to fulfill the requirements of the common programmer and user interfaces, for example, through Systems Application Architecture, announced in March 1987.

The basis of automatic data routing is present in APPN at the physical level of SNA, in APPC at the logical level and in the mainframe environment Transparent Service Access Facility at the application service level.

In addition, the IDNX (an OEM product from Network Equipment Technologies, Inc.) and IBM's Token-Ring Network architecture and 3737 Channel-to-Channel Unit provide the capability for high-bandwidth communications at T-1 (1.544M bit/sec), T-3 (45M bit/sec) and beyond. IBM is experimenting in the laboratory with transfer rates of more than 300M bit/sec.

The data storage infrastructure is also in place under the IMS, DB2 and SQL/DS complex. The capability for relational data base management was supported first at the mainframe level and then at the mid-range; it will now be implemented at the Personal System/2 level by the Database Manager in OS/2 Extended Edition.

Transformation refers to the ability to make translations between processor environments without user input. Typically, this is handled by protocol converters. In the emerging network environment, this task will be handled by the network itself, through either the network software or the operating system.

IBM's objective for transparent SNA is to make the entry, storage, processing, transmission and management of communications traffic across a global network possible with little effort from the user. This will make it more in line with the Open Systems Interconnection model, although the two models will not be exactly alike. If IBM can fulfill these goals, SNA will operate globally as easily as a personal computer operates locally.

Telecom

BUYER'S GUIDE

Hybrids and small PBXs

Big features, small switches

The latest crop of hybrids and small private branch exchanges prove that good things do come in small packages.

CONTINUED FROM PAGE 1

Hybrid switches encompass many features of key systems while offering the advanced functionality of PBXs. For example, the hybrid can be configured as a multifunction key system and can furnish PBX facilities such as call forwarding, calling number display at the station, speed calling, automatic route selection, station message detail recording and multiline conferencing.

The hybrids appeal to companies that have reached the upper limits of their key systems and want to take advantage of PBX features while still maintaining some key system features.

While hybrids are capable systems, they lack the networking abilities of PBXs. For example, hybrids cannot look ahead and determine if a resource or extension is available before allowing a long-distance call to be completed. Many hybrids also lack sophisticated queuing-to-resources facilities.

In the past, few small PBXs could handle data at rates higher than 19.2K bit/sec, but many now handle data rates up to 64K bit/sec. That's good news for companies using personal computers as terminals, since it permits files to be up- and downloaded more quickly.

The automatic call distribution facilities are also more sophisticated than earlier versions, offering more efficient routing of incoming calls to available agents. Automatic call distribution also comes with sophisticated reporting services to permit customers to measure the efficiency of each agent.

The voice-messaging facilities allow users to establish electronic mailboxes where messages can be left. For the most part, vendors have integrated this service into the PBX. Such integration permits customers to use the PBX to activate a message-waiting indicator on telephones or divert unanswered calls to a voice-messaging system.

ISDN news

The really big news in this market is the commitment by many vendors to provide the capability for Basic Rate and Primary Rate ISDN. Once the CCITT recommendation for ISDN is completed and adopted by the industry, and once carriers begin providing wide-scale ISDN, the door will open for networking PBXs from diverse vendors.

Currently there are two ISDN services tariffed by AT&T. Private Line Service Tariff No. 9 supports Primary Rate Interfacing and call-by-call services; Megacom Tariff No. 2 (sometimes called Info 2) also provides Primary Rate Interfacing and allows the calling number to be signaled and identified at the receiving locations. In addition, Illinois Bell Telephone Co. has tariffed Basic Rate ISDN.

The CCITT standard for Basic Rate (2B+D) service has not yet been completed. Standards have been established only for certain layers of the Primary Rate (23B+D).

So what can companies do with ISDN today? Gihon Kim, vice-president of engineering and planning for Integrated Network Corp., a Bridgewater, N.J.-based telecommunications consulting firm, sees intrapremises station-to-PBX calls and commu-

(continued on page 42)

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

(continued from page 41)

nications between single-vendor PBXs as initial applications.

In both cases, according to Kim, a proprietary signaling scheme will be employed for the Basic Rate and probably the Primary Rate Interface. These schemes will be replaced by the CCITT ISDN recommendation once it's fully defined.

The vendors surveyed for this Buyer's Guide all stated that they were studying the available CCITT recommendation as part of their ISDN effort.

One company that isn't using proprietary signaling, at least not completely, is Northern Telecom, Inc. Jean Poirier, group product manager for Meridian SL-1 networks, says that Northern Telecom's implementation is a Link Access Procedure D (LAP D) Primary Rate Interface that conforms to CCITT 1984 and 1988 recommendations for ISDN Layers 1, 2 and 3, even though the Layer 3 recommendations haven't been fully firmed up. LAP D provides a form of communications between the network user and the service provider for the purpose of requesting service and reporting status of the session.

"The 1984 specs for Layers 1 and 2 are defined, and Layer 3 is sufficiently defined to do call setup, teardown and user telephone number identification," Poirier states, "and the 1988 recommendation will take care of the rest of Layer 3."

AT&T, the only other vendor surveyed with operable ISDN, also conforms to the CCITT standard. ISDN capability, however, is currently available only on the large System 85 PBX, although it is planned for the System 75.

According to an AT&T spokeswoman, there has not been sufficient demand to provide ISDN capability for the System 25, which is included in this survey.

ISDN capability is available now for the entire Meridian SL-1 family, and it interfaces with public nets.

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ISDN capability is available now for the entire Meridian SL-1 family, and those products interface with public networks. "Right now, we'll work with AT&T's Info 2 [Megacom Tariff No. 2], and we can send caller ID at the Primary Rate to an SL PBX," Poirier says.

Currently, the Northern Telecom data signaling is proprietary and does not conform to the data recommendation set by the CCITT. According to Poirier, signaling that conforms to the standard will be implemented as soon as all vendors adopt the CCITT data signaling recommendation for ISDN. He expects that to happen by the end of this year. Northern Telecom plans to put ISDN capability into its DMS-100 and DMS-250 switches, as well.

ISDN's ability to transmit the caller's telephone number opens the way to a long-desired application: automatic retrieval of a caller's record. With this, users can program a data base to retrieve individual customer or employee records based on the telephone number from which the customer called. They can then display the records on the workstation's screen. For service departments or service-oriented companies, that means all information regarding the customer will be available before the agent makes voice contact, thus saving a considerable amount of time.

"That's a very significant ISDN application," says Mike Canova, a consultant with Network Strategies, Inc., a communications consulting company based in Fairfax, Va. "Too often, people think of ISDN as a means of transmitting voice and data simultaneously at high speeds, but applications like that are also very important."

Bart Stuck, vice-president and director of technology for Probe Research, Inc., a market research and consulting company in Morristown, N.J., says that while such an application is important, it will be used primarily to service residential customers. "Companies and people within companies are constantly changing their telephone numbers," Stuck says, "so it could be quite a job keeping the data base updated. People don't change their residences that often, however."

The RBHCs have become quite aggressive in making Centrex more competitive in the PBX arena.

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Stuck believes that more users will benefit from the 64K bit/sec transfer rate, especially if large files are being transmitted.

AT&T's ISDN is no paper tiger, either. It was demonstrated in January and February of this year in a test involving American Transtech (an AT&T subsidiary located in Jacksonville, Fla.), System 85 PBXs and the aforementioned Tariff No. 2 service.

The regional Bell holding companies have become quite aggressive in making Centrex more competitive in the PBX arena, and they have added automatic call distribution and ISDN to their arsenals.

Centrex ISDN, according to Bruce Wan-

Can your async network pass this simple test?

less, a consultant liaison representative with US West Communications in Minneapolis, can display the intracompany caller's telephone number as well as 800-number source calls. Wanless states that although the level of service might vary with the RBHC, any RBHC employing an AT&T 1AESS, 5ESS or Northern Telecom DMS-100 should be able to furnish ISDN and automatic call distribution.

Automatic call distribution

As smaller companies become more sophisticated in their operations, automatic call distribution becomes a vital part of the successful business equation. That's certainly the case in any telemarketing application, since the efficient distribution of calls and the monitoring of personnel performance are critical to its success.

Several vendors of small PBXs have recognized the need for automatic call distribution and have responded with fairly powerful products. Of those vendors in the survey stating that they provide automatic call distribution support, for example, most route incoming calls based on the agent's availability. This means that the person who has been idle for the longest period of time gets the next call. The exception is the IBM/Rolm VSCBX, which supports only hunt groups (hunt groups search for the first available agent's extension and routes the call to that number).

Another reason for use of automatic call distribution is its ability to measure agent efficiency. Management needs to know the busiest periods, time spent on each call, incoming calls dropped and call wrap-up time. Calls get dropped mainly because potential customers get tired of hearing the "please wait and the next available agent will assist you" message and hang up. The dropped call report also usually shows how long customers waited before bailing out and, presumably, calling a competitor. The call wrap-up report indicates the time operators have to spend entering additional information concerning the completed transaction before indicating they're ready for the next call.

Several vendors of small PBXs have recognized the need for automatic call distribution.

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All vendors surveyed claim to furnish reports showing calls per agent, call duration and dropped calls. However, several asked for an explanation of what wrap-up time meant, hesitated, and then claimed to provide it. Users should be careful to verify wrap-up time capabilities if this feature is important to their operations.

Account codes

Smaller firms, especially service-oriented companies such as law and accounting firms, need a convenient way to account for and bill back client telephone charges. Every vendor in this survey said it has a means whereby client codes can be established, calls recorded to them and billback information generated. The vendors also said that each code can be programmed and entered by pressing a single telephone button, similar to speed dialing.

Voice messaging is another feature more small companies want, and most vendors in this market have responded with units that are an integral part of the PBX. Voice-messaging systems establish electronic mailboxes in which callers deposit messages. The more sophisticated systems also let users establish distribution lists for broadcasting messages to groups of mailbox holders.

Voice-messaging systems interface with the PBX or Centrex trunks and lines, digitize the analog voice inputs via a coder/decoder and store the quantized voice on disk. Since the disk size determines the system's capacity and has a big influence on its overall cost, it's important to ascertain the number of bits per second required to quantize the voice, the data compression ratio employed to store it and the overhead, or dead space, needed for each recording. Some vendors do an excellent job quantizing, compressing and storing voice with the result that storage hours (the measure of message capacity) are high.

Voice messaging is another feature more small companies want, and most vendors have responded.

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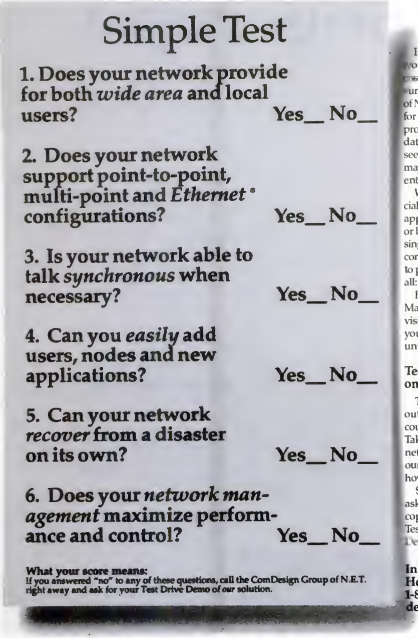
Voice-messaging systems are not inexpensive, mainly due to the cost of the disk used for storage. Probe Research's Stuck says that the overall cost of storing voice will come down when optical disks come into play. But, he says, "I believe optical disks with gigabyte capacity will be shipped this year, and [therefore] storage costs will no longer be a big factor in voice messaging."

Like their larger siblings, small PBXs must survive in a competitive market that for the last few years has been marked by

(continued on page 52)



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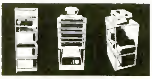

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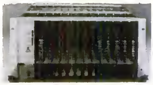

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	System 25	PBX	200	8	256	2,500	115		19.2K asynchronous	Integrated			$450/$750
	System 75XE	PBX	600	8 or 18	512	10,800	241	DMI	19.2K asynchronous, 64K synchronous	Integrated	Optional		$600/$800
Compunetics, Inc. Monroeville, Pa.	Compunetics Switching Network	PBX	300	18	Space-division multiplexing	4,500	NA	All hosts	6M synchronous per line	Can be interfaced	✓		NA/$300 (no telephones included)
Ericsson Information Systems, Inc. Richardson, Texas	MD 110/40	PBX	400	8	1,024	2,160	200	DMI	19.2K asynchronous, 64K synchronous	Integrated	Optional		$500/$750
Fujitsu GTE Business Systems, Inc. Tempe, Ariz.	Starlog	Hybrid	240	8 or 18	512	1,250	192		19.2K asynchronous and synchronous	Can be interfaced	Standard with Feature Pack D, optional on other versions		$260/$450
	Omni S I	PBX	256	8 or 18	144	2,800	72	X.25	19.2K asynchronous, 64K synchronous	Integrated	Optional	Available in late 1988	$160/$220
Hitachi America, Ltd., Inc. Norcross, Ga.	HD 200	PBX	200	8	256	1,200	123		No data support	Integrated			$250/$500
	MDX	PBX	328	8	112	7,200	56		9.6K asynchronous, 19.2K synchronous	Integrated			$350/$600
IBM/Rolm Systems Division Santa Clara, Calif.	Redwood Model II	PBX	144	8	256	NA	92		4.8K asynchronous	Can be interfaced			$400/$700
	VSCBX	PBX	304	8	384	10,000	192		19.2K asynchronous, 56K synchronous	Integrated	Optional		$550/$650
Memorex Telex Corp. Tulsa, Okla.	Telex 1001 VS	PBX	256	32	256	8,500	128	IBM 3270 and System/3X	19.2K asynchronous	Integrated	✓		$475/$700
Mitel, Inc. Boca Raton, Fla.	SX-200	PBX	130	12	512	1,423	100		19.2K asynchronous	Integrated	✓		Contact distributor
	SX-200 Digital PBX	PBX	300	12	368	1,423	200		19.2K asynchronous				$256/$296
NEC America, Inc. Small Systems Division Melville, N.Y.	SIM	PBX	464	4, 8 or 18	464	3,200	232		19.2K asynchronous, 9.6K synchronous	Can be interfaced			Contact distributor
	Electra Mark II	Hybrid	80	4	256	NA	128		9.6K asynchronous	Integrated			Contact distributor
Northern Telecom, Inc. Richardson, Texas	Meridian SL1-ST	PBX	600	4 or 8	360	28,000	180	CPI; IBM 3270, System/3X emulation; X.25	19.2K asynchronous; 56K synchronous; 2.56M for personal computer networking	Integrated	Optional	✓	$550/$650
	SL1-RT	PBX	600	4 or 8	360	28,000	180	CPI; IBM 3270, System/X emulation; X.25	19.2K asynchronous; 56K synchronous; 2.56M for personal computer networking	Integrated	Optional	✓	$650/$800
Shared Business Exchange, Inc. Dallas	System One	Hybrid	288	3, 6 or 12	256	10,000	128	DMI	19.2K asynchronous	Integrated	Optional		$650/$750
Siemens Information Systems, Inc. Communication Systems and Network Group Boca Raton, Fla.	Saturn Model II	PBX or Hybrid	224	8 or 16	256	10,000	112		19.2K asynchronous, 64K synchronous	Integrated	Optional		$700/ $1,000
Telenova, Inc. Los Gatos, Calif.	Telenova I	PBX	200	8	512	5,000	256	Proprietary	19.2K asynchronous and synchronous	Integrated	Optional		$500/ $1,100
TIE/communications, Inc. Shelton, Conn.	Ultracom DCX	Hybrid	160	160	208	5,000	104		19.2K asynchronous	Integrated			$400/$550
	Data Star	PBX	192	16	256	5,000	128		19.2K asynchronous	Integrated	Optional		$450/$600
	Morgan	PBX	144	8	768	22,000	240	DMI	19.2K asynchronous, 64K synchronous	Integrated			$350/$500
Toshiba America, Inc. Tustin, Calif.	Perception II	PBX	240	8	384	152	76	Proprietary	19.2K asynchronous, 9.6K synchronous	Integrated	Can be interfaced		Contact distributor
	Perception IIE	Hybrid	192	8	192	NA	96	Proprietary	19.2K asynchronous, 9.6K synchronous	Integrated			Contact distributor

CPI = Computer-to-PBX interface
DMI = AT&T's Digital Multiplexed Interface
ISDN = Integrated Services Digital Network
NA = Information not available
PBX = Private branch exchange

This chart includes a representative selection of vendors in the hybrid and small PBX market. Most vendors produce other hybrids or small PBXs, and many vendors not included manufacture a full range of competitive products.

SOURCE: TMS CORP. DEVON, PA.

Big features, small switches

continued from page 43

vicious price-cutting. The consensus among consultants is that vendors will sell the switch and station sets at cut-rate prices in order to get the sale, hoping to make a few bucks when customers buy add-ons like more sophisticated software, voice messaging and automatic call distribution.

See chart on page 51.

Paul Daubitz, president of Associated Telemanagement, Inc., a Boston-based consultancy, says PBXs have become commodity-like and users make their choices "based on price and who's going to be in business next year."

He also says he expects price reductions throughout the industry in the near future. "We recently priced a 50-station [Northern Telecom] SL-1ST with high-quality phones and got quoted $44,000," Daubitz says. "Last week, we got new prices [from Northern Telecom], and the same system now costs $38,000. You know the other guys are going to cut prices too."

Vendors will sell the switch and station sets at cut-rate prices in order to get the sale.

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IBM primps OS/2 EE for debut

continued from page 1

viewing OS/2 Extended Edition as overkill. "They have current versions of network operating systems that they can use and that will work," Freund said. He pointed out, however, that "for people linking their LANs to mainframes, Extended Edition is key. It allows LANs to connect cleanly to host environments."

IBM has had high attendance at OS/2 applications forums over the past 12 months and takes this as a sign of strong interest in OS/2 Extended Edition. "If we have gotten the message across, we think the demand is going to be significant," stated Al Young, an IBM senior planner for OS/2 Extended Edition. "And we have made the statement that this is the strategic operating system in the personal system arena."

Even without local networking support, IBM views Extended Edition as having "significant applicability in the real world," Young said. "There is a large installed base [of 3270 devices], and so there is a large requirement for 3270 communications, independent of local networks. As users begin to look at more advanced applications, either now or in the future, the idea would be to install the machine that has the capability to let you grow into that and yet will support 3270 communications today," he said.

OS/2 Extended Edition contains all the basic functionality of the IBM OS/2 Standard Edition. In addition, both the Standard and Extended Editions will support Presentation Manager, a graphics-based user interface, when their respective 1.1 versions are available in November.

Beyond the OS/2 basics, Extended Edition includes the Communications Manager and the Database Manager. IBM's strategy with Extended Edition is to build functionality, such as host communications and data base management, into the operating system. Microsoft Corp., by contrast, is supporting such additional functionality through separate products, such as the SQL Server it is developing with Ashton-Tate. Microsoft will likely support host communications through separate software gateways.

Similarly, IBM will be offering support for its server software, LAN Server, as part of Communications Manager in Version 1.1 of Extended Edition. Workstations running this version of Extended Edition will be capable of talking to any server running LAN Server software. By contrast, Microsoft has not provided networking support as part of OS/2.

Both vendors, however, have designed their network server software as separate products. IBM's LAN Server and Microsoft's LAN Manager are server-based software packages that provide for the sharing of files, printers and other network resources. IBM's LAN Server is slated for delivery in November.

OS/2 Extended Edition will also include the equivalent of the APPC/PC program for MS-DOS.

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When Version 1.0 of Extended Edition begins shipping, users will have the ability to install any mix of Communications Manager and Database Manager functions. IBM is recommending that users configure Personal System/2s with 4M to 5M bytes of memory when installing OS/2.

In Version 1.0, the Communications Manager will support several types of terminal emulation, peer-to-peer communications via Advanced Program-to-Program Communications, a number of application programming interfaces and network management. The Communications Manager is the key piece of software for fitting personal computers into IBM's Systems Network Architecture, Young noted.

"Moving into the 1990s time frame, we see more and more dependence on communications in order to get the information processing job done," Young said. "We're addressing that requirement by putting more and more communications into the operating system."

Emulation for the IBM 3270 synchronous terminals, as well as the IBM 3101 and Digital Equipment Corp. VT-100 asynchronous terminals, will be supported in Version 1.0 of Extended Edition. Multiple types of terminals can be emulated simultaneously, using both direct and remote communications links, including Synchronous Data Link Control, Distributed Function Terminals mode and asynchronous links.

The Asynchronous Communications Device Interface is one of several programming interfaces supported in Extended Edition. This interface will provide application developers with a degree of independence from the asynchronous hardware used, and it will make it easier to write applications to exchange data over asynchronous links.

Users of Extended Edition will get the equivalent of Version 3.0 of the IBM 3270 PC Emulation Program, including support for the Enhanced Connectivity Facilities (ECF) and its Server-Requester Programming Interface (SRPI), said Thomas Francese, an IBM senior planner for OS/2 Extended Edition.

ECF allows personal computers to share resources with an IBM System/370, providing virtual disk, file and print capabilities, and file transfer. SRPI is a programming interface that allows personal computer-based applications to issue requests for services and receive replies from System/370 hosts. Hosts must run software that supports ECF and SRPI.

OS/2 Extended Edition will also include the equivalent of the APPC/PC program for MS-DOS, modified to take advantage of OS/2 calls and enhanced to support PU 2.1 devices as well as the LU 6.2 protocols. By supporting APPC in this way, users of Extended Edition will be able to communicate interactively on a peer-to-peer basis with other computers that support APPC, according to an IBM spokesman.

The OS/2 Extended Edition, when used in conjunction with models of the Personal System/2 line based on the Micro Channel bus, will allow users to run more than one communications session at a time, Francese said. A personal computer user could be downloading data from an IBM mainframe using 3270 emulation while simultaneously transmitting data to another personal computer user via an LU 6.2 session, he explained.

In addition, the Communications Manager has built-in net management, including the ability to trace and log errors. The Communications Manager can send alerts up to NetView over an LU 6.2 link, Francese said.

IBM promises that the Database Manager will eventually support distributed data base management system applications. In its first version, the Database Manager will support relational DBMS functions, including query and report writing capabilities. Big Blue is planning to provide a capability called remote data services, which will allow multiple users to access a single data base simultaneously, Francese said.

"From a price/performance standpoint, it's nice to see an integrated package come out that gives you an operating system, a complete data base application package and all this communications support, plus all the interfaces folks have had to scramble for in the past through several packages. Even with just what we're going to ship in July, it's a significant chunk," he said.

Although OS/2 Extended Edition retails for $795, Francese said most IBM accounts will probably pay under $600 with volume discounts, and some customers could get the software for under $450. In contrast, based on figures from Computerland Corp., MS-DOS is priced around $120, and IBM's OS/2 Standard Edition costs roughly $325.

Letters

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when a slightly wider data channel might suffice in most instances.

Rosner ably points out many of the shortcomings and unknown costs of the much-touted ISDN. Unfortunately, some MIS and telecommunications planners see the evolution to integrated services as a ticket to fame and higher position. This is technology for the sake of technology.

ISDN has become the flagship driving video teleconferencing and the merging of voice and data facilities, instead of the possible means to implement these technologies where justifiable. Rationally, in 80% of the above-mentioned 80% of companies, including some widely dispersed Fortune 500 companies, there is little to be gained by integrating voice and data.

The real need, unrecognized by many corporate planners, is to give the small branch offices the tools to improve communications with customers while improving their ability to process sales orders.

Other companies are purchasing only digital private branch exchange and key systems in preparation for the digital future. Unfortunately, only a few PBXs are capable of handling ISDN and there are no key systems capable of handling or being retrofitted for ISDN (aside from the fact that the parameters of ISDN have not yet been finalized). Offices with no leased voice facilities, less than 30 central office lines and less than five data circuits probably will never need to be connected to any type of integrated digital network.

Rosner points out the present-day solutions of T-1 and packet-switching technologies as current alternatives to ISDN. If our company facilities are not using these technologies today, why are we sitting around waiting for the ISDN wave to break over us? Even with the declining cost of television and magnetic memory, video teleconferencing and mega-bandwidth capacity will probably never justify 23B+D service at most small district and regional offices.

In the battle against bypass, to the RBHCs ISDN stands for Incomplete Solutions that Demoralize and Neutralize decision makers.

Name withheld by request

Local connections without delays

continued from page 55

PBX or Banyan server to interface them. While ISN handles personal computers, it does so through an asynchronous interface; therefore, the device functions as an asynchronous terminal. ISN uses local concentrators that accommodate five inputs per twisted pair, cutting down on the amount of wire needed. ISN loses data transmission capacity by doing this, but many applications do fine at 19.2K bit/sec.

LANStar directly accepts IBM Personal Computers and Macintoshes and is better suited for high-speed data applications. LANStar uses only a direct memory interface card to connect the personal computer with the backbone, forcing the user to dedicate two sets of wire per connection.

For users interested in ISDN, LANStar's packet is designed to carry the 64K bit/sec data and 16K bit/sec signal channel. LANStar is also offered with an optional interface to the SL-1, whereby the packet transfer provides a T-1 connection.

Undoubtedly, some will say this evaluation is an "apples-to-oranges" comparison, since ISN isn't intended to network personal computers, and LANStar isn't intended to be an omnibus connection and transport medium. However, to users in the market for an alternative to Ethernet or token-passing local-area networks, ISN and LANStar are competitors.

Microwave net to slash costs

continued from page 1

using 18-GHz microwave equipment with a capacity of 25M bit/sec.

Bank branches will be tied to the microwave network with digital T-1 facilities and analog leased lines, depending on the traffic requirements of the individual sites.

Because of the branches' locations, it happens that the network will have a hub in every local access and transport area in the state. When complete, the network will allow bank employees to access any remote bank office or branch for both voice and data needs and pay only for local access.

Each automated branch connected to the network is equipped with teller display terminals, printers and stand-alone terminal controllers provided by SCI Systems, Inc. of Huntsville, Ala. The stand-alone controllers are equipped to keep a branch operating even if the remote IBM 3084Q computer in the bank's Baltimore headquarters goes down, according to Charles Hooper, a senior vice-president at the bank.

The microwave network will support a variety of protocols, including asynchronous, synchronous and Synchronous Data Link Control.

The first step

The first backbone, running 120 miles southeast from the bank's operations center here to its data and credit card center in Millsboro, Del., became operational in June, replacing part of a multipoint T-1 network.

Employees are already using the network to retrieve data on customer accounts and to call other branches, said C. Donald Rees, the bank's assistant vice-president of telecommunications.

The operations center is home to an IBM 3084Q mainframe used to support customers' balance records. Those records are updated on an IBM 3834J mainframe computer and transferred daily to the bank's headquarters here. Thanks to this arrangement, each computer can back up the other in case one of them goes down, Hooper said.

The initial microwave backbone running between Baltimore and Millsboro has three hops: Curtis Bay, Md., Church Hill, Md., and Harrington, Del., and an 18-GHz tail circuit running from Curtis Bay to Bay Meadow, Md.

The second backbone will run about 80 miles southeast from the Baltimore headquarters to the Millsboro facility. It is expected to be cut over in August, Rees said.

This backbone, which runs roughly parallel but 15 to 35 miles south of the first backbone, will have four hops and one 18-GHz tail to Salisbury, Md. Although they serve different sites, the parallel microwave links can be used to back each other up, Rees said.

The bank will proceed with a third backbone linking Baltimore, Frederick, Md., and Rockville, Md., based on how the first two backbones perform, Rees said. This network will run about 60 miles northwest of Baltimore.

The biggest problem was figuring out how to send the radio signal from Curtis Bay, Md., to Church Hill, Md., over the Chesapeake Bay. The danger of huge ships on the bay blocking the transmission path called for some careful planning, said the assistant vice-president of telecommunications.

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The microwave equipment on the $4 million network was provided by Harris Corp.'s Farinon Division in San Carlos, Calif., and cost about $1.7 million. The balance of the network cost was for 13 Northern Telecom, Inc. SL-1 private branch exchanges purchased over the past two to three years. The SL-1s are outfitted with T-1 interfaces, Hooper said.

Besides the microwave equipment, Farinon also provided the bank with its Farscan network management software, which runs on an IBM Personal Computer and can be used as a master control center for the network.

The bank uses the microcomputer at its operations center here to monitor any node on the network and reroute traffic when problems arise, Rees said.

The network is further protected in that each network hop is outfitted with spare radio equipment that automatically steps in when the primary equipment fails, Rees said.

The bank's 30-member communications department has been responsible for putting the network in place.

Ongoing maintenance and support will be provided by Syntonic Technology of Harrisburg, Pa., an authorized reseller of Farinon equipment.

Getting the initial backbone up and running was not without its difficulties, according to Rees, who was hired by the bank about 18 months ago to head the project.

"In figuring out what microwave paths to take, we had to take into account everything from the patterns of geese flights to TV reception for people out in the country," Rees said.

The biggest problem, however, was figuring out how to send the radio signal from Curtis Bay, Md., to Church Hill, Md., over the Chesapeake Bay.

The danger of huge ships on the bay blocking the transmission path called for some careful planning, Rees said.

While the bank considered other transmission facilities, such as fiber optics, microwave proved to be the most practical, Hooper said.

"Fiber wasn't available into Millsboro," Hooper said. "With microwave, we have a presence in all of the LATAs that we wanted to be in."

FCC gave an opening

The bank began contemplating a communications overhaul in 1985 in preparation for potential tariff rate hikes, Hooper explained.

The network was made possible, in part, by the Federal Communications Commission's recent decision to relax regulations that prohibited commercial customers from using wideband microwave systems.

"The opening that the FCC gave us was a godsend," Rees said, because the narrower bandwidths available earlier were insufficient for handling the traffic demands of the data-intensive banking industry.

Wang announces TCP/IP software

continued from page 3

for Wang," Doyle said. "It's something they needed to do to fill out their communications suite, and they've finally done it."

John McCarthy, an analyst with Forrester Research, Inc. in Cambridge, Mass., agreed with Doyle. "I don't think Wang really looks at this as a revenue-generating product," McCarthy said. He said the product was a way to eliminate a problem for Wang when trying to sell its systems to users who have TCP/IP-based environments.

McCarthy said Wang's introduction of VS TCP Interconnect shows TCP/IP is becoming a base-level requirement for multivendor environments.

Fairweather said the product has been in beta test at two government agencies and a university, but she would not give further details on those users.

Fairweather said Wang hopes it will make non-Wang users more attracted to the firm's products.

The product is available now. Licensing fees range from $5,500 to $15,500, depending on configuration.

MAP center puts GM on road

continued from page 1

in a hands-on MAP classroom. Eventually, the ENE '88 equipment will be linked to equipment from many of the other ENE '88 participants over an X.25 wide-area packet-switching network. ENE '88 participants hope to use this network in joint MAP research projects.

All of this capital and expertise has been assembled for a common purpose: to help GM regain its edge over domestic and foreign automakers by using the most advanced factory automation technologies available. GM is relying on this center to spur implementation of MAP — which the company believes is vital for its revitalization strategy.

"The ability to let factory machines communicate with each other on a nonproprietary, flexible network is fundamental to the way a plant operates," commented William Riker, a senior project engineer on GM's Advanced Engineering Staff. Riker heads up GM's MAP laboratories here. "It lets a factory work more efficiently, retool more flexibly and do things GM needs to do to compete in a global market."

Competing more effectively is top priority right now for GM. In little more than a decade, GM's share of U.S. auto sales plunged from more than 50% to just 33%, as of last December. Last year, its own car sales tumbled a frightening 21%.

Industry reports say that GM has higher production costs than any other U.S. automaker.

As part of an effort to cut costs, GM executives have hinted that they plan to close factories. Those that remain open are expected to produce more cars. GM also believes that implementation of MAP will help it cut manufacturing costs (see "GM study finds MAP networks cost less," page 27).

GM engineers promote MAP as a means to improve factory management. Riker claims, for instance, that MAP is more reliable than proprietary networks. He adds that the open standard makes it easier to retool when a plant decides to produce a new car.

This kind of flexibility is vital to reducing lead times between product design and production, an area where domestic automakers trail the Japanese.

"Like it or not, we [in the center] are MAP salesmen," Riker said. "We raise the consciousness of our factory managers and persuade them about the advantages of going with MAP."

Some of the most important facilities are laboratories in the Technology Engineering for Automotive Manufacturing (TEAM) center.

Currently, the TEAM center has two laboratories, a fully operational MAP Carrierband Lab and a partially completed Fiber Optics Lab. By October, GM plans to finish the fiber lab and unveil a third, the MAP Application Lab, designed to test applications running under both MAP and the Technical and Office Protocol, according to Kaminski.

More than 32 vendors donated over $3 million worth of computer equipment to the Carrierband Lab, which was finished last August. Carrierband cable handles single-channel data communications over distances between 500 and 700 meters. It was first integrated into MAP in Version 2.2.

Riker said 90% to 95% of the devices on a factory floor send and receive data over this relatively inexpensive cable.

In this lab, several dozen machines are linked on a MAP Version 2.2 network, equipped with Manufacturing Message Specification, an application standard specified in MAP Version 3.0. Riker said the lab was engineered especially to help GM factories convert from earlier versions of MAP to Version 3.0.

The TEAM center is playing a key role in several major projects. For example, it is being used to test all MAP equipment to be used in the massive, $3.5 billion, 3.8 million-sq.-ft. factory now being built as part of GM's heralded Saturn "car-of-the-future" project.

The Saturn facility will run an enterprisewide MAP Version 2.2 network that will eventually be converted to Version 3.0, according to Riker.

This factory is slated to start operations in 1990. GM reportedly is betting big that it will turn the company's lagging profits around.

Despite all the MAP activity in this center and elsewhere in GM, some critics have accused the automaker of backing off its commitment to MAP. Some of the criticism was sparked by GM's announcement at ENE '88 that it and other large users would scale back funding for the MAP/TOP Users Group.

Other critics have complained that the company is implementing MAP too slowly.

Yet according to Kaminski, such accusations are unfounded. "We are completely committed to MAP, and I think everyone understands that," he said.

He added that, unlike in years past when GM might completely gut a factory and install modern technology, including MAP, the company is now focusing on selective modernization.

"I call it optimal automation," he said. "We strive to achieve the best balance of new technology with existing systems. We don't walk in and rip everything out."

Kaminski estimated that 75% of all new networking equipment being installed in GM factories is MAP equipment. About 32 of GM's 160 factories worldwide have installed some form of the MAP network, with six more expected to sign up this year, Riker said.

IBM readies network offerings

continued from page 2

ter Research, Inc., said that, in keeping with its desire to make its products more user-friendly, IBM "will scrap the current NetView command language, CLIST, and replace it with REX, which is one of the command languages used in IBM's VM operating system.

"A lot of users complained about CLIST because it was so difficult to use. REX, on the other hand, is easier, faster, more flexible and features a lot more commands," Colony said.

Net management repository

The second big networking announcement expected from IBM this fall, according to analysts and consultants, is a new network management repository. Repositories are common data bases used to retain information regarding the network and its use.

According to Frank Dzubeck, president of Washington, D.C.-based Communications Network Architects, Inc., and Herman, the new Repository will replace IBM's present repository, called InfoMan. InfoMan, is "a fairly weak and rudimentary repository that lacks an integrated, well-designed configuration to drive network management applications," Herman said.

InfoMan, explained Herman, is not based on a mainline IBM data base system, while the new Repository will probably be based on DB2. "InfoMan doesn't provide a very complete set of applications," Herman added.

The Repository will consist of a set of administrative network applications structured around a unified configuration data base. "That's a big step forward for IBM; most other vendors are already designing their network management systems around a data base," Herman observed.

Finally, this fall, analysts expect IBM to announce an enhanced 3174 controller, informally dubbed the Navigator, that will support the forthcoming 16M bit/sec Token-Ring, just as the current 3174 supports today's 4M bit/sec Token-Ring.

Navigator features

According to information released by IBM at the spring briefing and private discussions with analysts, the Navigator will feature expanded main memory and disk memory to accommodate the faster local network.

The 512K bytes of main memory in the current 3174 will be expanded to 2M bytes in the Navigator, and disk memory will be increased to 300M bytes, up from 60M bytes.

The consultants also detailed how IBM intends to position the forthcoming controller. "From what I've been told, the so-called Navigator will be used as a LAN-to-WAN gateway to tie the 16M bit/sec Token-Ring to IBM SNA backbone networks," said NSI's Passmore.

This implementation makes sense, Passmore said, "because IBM users need to tie Token-Rings to their existing SNA wide-area networks."

Colony did not attend the consultants' briefing but was told about the Navigator in informal briefings with IBM executives.

"I was told that CPD [IBM's Communication Products Division] is positioning the Navigator as a quasi server that will compete with their low-end AS/400 line, which IBM is also positioning as a server," Colony said.

Herman, who attended the IBM briefing, contended that the forthcoming Navigator will also be used as a gateway to interconnect various Token-Rings.

"Initially, the main purpose of IBM's 16M bit/sec Token-Ring will be as a backbone to connect 4M bit/sec rings, so it makes sense for them to have a gateway to connect the 16M rings to the slower rings," Herman said.

According to Herman, IBM has of late been positioning the 3174 "as a more general-purpose gateway, using it as a node on the network to access the services of the Token-Ring and connecting rings."

Colony reported he was also told by IBM that it would introduce a Model 3715 front-end processor.

"Essentially, it's supposed to be a network node or a baby version of the 3745. The 3715 will feature T-1 connections and the fault tolerance of the 3745 and will likely support both the 4M bit/sec and 16M Token-Rings," Colony explained.

Furthermore, he stated, the 3715 will support IBM's SNA Network Interconnect and will act as a gateway linking SNA networks.

Planned offerings

All of the consultants and analysts who spoke with *Network World* were in accord on the substance of the planned IBM product offerings. The consensus was that IBM is working on products that third-party vendors have already introduced; that is, they are something short of groundbreaking.

But the analysts and consultants said they were impressed with the work IBM was doing in OS/2.

"They're paying a lot of attention to the LAN market and the concept of servers. There was a great deal of discussion about providing server functions on the PS/2, Token-Rings and mainframes," Herman said.

The consultants disagreed only on the date of the expected announcements. Some analysts said the introductions were planned for mid-to-late September, while others insisted the formal unveiling will come on Oct. 16.

"People that I've spoken to within IBM have all pinpointed Oct. 16 as the date for the networking announcements," Colony said.

But Dzubeck asserted, "IBM has already booked the hall for September." ◼

Calendar

July 27-28, Washington, D.C. — Long Distance Opportunities for the Regional IXC. Contact: Tele-Strategies, Inc., 1355 Beverly Road, McLean, Va. 22101.

July 27-29, Los Angeles — Introduction to Data Communications. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

July 27-29, New York — Understanding PBX Systems and Technology. Contact: BCR Enterprises, Inc., 950 York Road, Hinsdale, Ill. 60521.

July 28, Dallas — A Practical Guide to Advanced Micro-to-Mini Communications. Contact: Emerald Technology, Inc., 18912 N. Creek Pkwy., Bothell, Wash. 98011.

July 28-29, St. Louis — LAN Troubleshooting and Maintenance. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

Aug. 1-3, Washington D.C. — Data Communications Network Design and Optimization. Contact: Institute for Advanced Technology, 1450 Energy Park Drive, St. Paul, Minn. 55108.

Aug. 1-5, Atlanta — SIGGRAPH '88. The 15th Annual Conference on Computer Graphics and Interactive Techniques. Contact: SIGGRAPH '88 Conference Management, Smith Bucklin and Associates, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

Aug. 1-5, San Diego — OMNICOM Week. Contact: OMNICOM, Inc., 115 Park St. SE, Vienna, Va. 22180.

Aug. 7, Toronto — Electronic Messaging Technologies: Their Impact on Doing Business. American Bar Association Annual Meeting. Contact: Independent Monitoring, 25A Frost St., Cambridge, Mass. 02140.

Aug. 9-11, Westmont, Ill. — Fifth Fiber Optic Showcase. Contact: Illinois Bell Fiber Optic Showcase, 225 W. Randolph, Floor 18F, Chicago, Ill. 60606.

Aug. 11-13, Boston — MACWORLD Expo. Contact: MACWORLD Expo, P.O. Box 155, Westwood, Mass. 02090.

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Local connections without delays

By John Hunter
Contributing Editor

Here's a local-area network wish list: cheap backbone (preferably using existing twisted-pair telephone wire), high data transfer rates (a million or two bit/sec would be fine), support for a wide range of terminals, computers and operating systems, and no chance of throughput degradation from packet collisions, heavy use or token handling schemes.

Two local net-type products trying to fit the bill are AT&T Communications, Inc.'s Information Systems Network (ISN) and Northern Telecom, Inc.'s Meridian LANStar/PC, commonly known as LANStar. While neither provides all of the above features, both come very close and are good alternatives for companies turned off by the limitations and expense of typical Ethernet and token-passing local-area networks.

Limits of LANs

Ethernet — Xerox Corp.'s version or IEEE 802.3 — has limitations, including poor performance under heavy traffic due to packet collisions and the high cost of backbone media when coaxial cable is used. Of course, customers can eliminate coaxial costs by using twisted-pair wires, but there are some data and distance trade-offs when that medium is used. For example, over 24- to 26-gauge twisted-pair wire, data can be transmitted at 10M bit/sec for up to 300 feet with acceptable loss. Using IBM Type 2 twisted-pair wiring, data can be sent 100 meters at the same rate.

Token-passing local networks eliminate collision problems. Only the terminal with the token can access the backbone to transmit data. Furthermore, IEEE 802.5 versions can run on low-cost twisted-pair wires. Token-passing local networks, however, can extract a heavy performance penalty if the network administrator does a poor job of evaluating the data transmission loads of each user. IEEE 802.4 and 802.5 specifications allow users to be assigned accessing priorities: Users with high priorities get line-access preference, while users with lower priorities get limited access ("Praise the LAN and pass the tokens," *NW*, April 25).

ISN and LANStar have none of these drawbacks. Both use conventional 22-, 24- and 26-gauge twisted-pair telephone wire as a backbone, both are configured as stars and terminate connections in a wiring box, and both switch data packets on a noncontention basis. Both products differ greatly, however, in their architecture, transmission speeds, variety of terminals handled and local network software support.

ISN components

The ISN consists of a packet controller, concentrators and device interface modules. The packet controller, the central component in the star configuration, switches packets between sending and receiving devices. The controller is offered in versions that handle 320, 1,680, and 1,920 asynchronous or synchronous devices at data rates up to 19.2K bit/sec. Its high-speed trunk transfers data at 9.6K to 2.048M bit/sec for twisted-pair wire and 8.64M bit/sec through fiber-optic cable. The data-switching speed of the controller's internal bus is also 8.64M bit/sec.

The concentrator is a statistical multiplexer equipped with interface modules for handling asynchronous (including personal computers), synchronous, IBM 3270, Binary Synchronous Communications, Systems Network Architecture/Synchronous Data Link Control and High-Level Data Link Control inputs. The concentrator handles as many as five interface modules, transmitting data to the packet controller over twisted-pair or fiber-optic cable at rates up to 19.2K bit/sec.

Two LAN products compared

	Vendor/Product	
	AT&T Communications, Inc. **Basking Ridge, N.J.** Information Systems Network (ISN)	**Northern Telecom, Inc., Dallas** Meridian LANStar/PC
Maximum number of ports	1,920	1,344
Backbone	Twisted pair	Twisted pair
Price per port	$410	$750 to $900

ISN's price is for a system supporting 100 asynchronous terminals. LANStar's prices are for the packet transport, PC interface cards and wiring to a wall jack.

SOURCE TMS CORP., DEVON, PA
GRAPHIC BY SUSAN SLATER

The asynchronous interface module (AIM) — also used for interfacing personal computers — has eight ports, each with a 2K-byte buffer. Its proprietary Universal Receiver Protocol handles internal flow control and error correction. All eight ports can operate at 19.2K bit/sec if data flow is bursty. Otherwise, the data rate is 9.6K bit/sec. If the device addressed at the far end is operating at a different speed, the AIM matches speeds with autobaud detection techniques.

The IBM 3270 interface module supports 3X78 and 3X79 terminals and 3X74 and 3276 controllers using IBM Type A coaxial cable. Baluns convert from coaxial cable to standard twisted-pair wiring and handle data at 19.2K bit/sec. Up to two terminals can be attached to each interface module.

In addition to interfacing with DEC and IBM hosts, ISN connects to AT&T System 75, System 85 and Dimension 2000 PBXs, as well as AT&T's Starlan. The ISN packet controller interfaces with the PBXs via Electronic Industries Association interface circuit packs. It supports data transfer rates from 300 to 64K bit/sec for Systems 75 and 85, and 19.2K bit/sec for the Dimension 2000.

The Starlan module allows ISN to serve as a backbone network to multiple Starlans and permits access to ISN hosts, communications facilities and ISN asynchronous end points. An Ethernet bridge interface module allows ISN to act as a backbone, linking up to nine Ethernet local networks. AT&T says up to 40 Ethernet networks can be bridged through intermediate Ethernets.

ISN is controlled by an AT&T proprietary operating system that handles network configuration, session establishment, packet switching, alternate routing, network security and network management. The latter works with AT&T's StarKeeper Network Management System, which checks for faults and performs diagnostics.

To route data, users signal the controller (or connections can be permanent) and indicate the end points. The packet controller assembles packets and routes data. Unlike traditional local networks in which every terminal on the network "sees" the packet and only one can take action, ISN routes the packet directly to the end point. The other terminals don't examine the packet as it goes by. This data-routing scheme is called perfect scheduling; it is also used by LANStar.

LANStar architecture

While ISN and LANStar can function as sophisticated switches, LANStar can also operate as a traditional personal computer local net by adding networking operating systems, such as Banyan Systems, Inc.'s VINES, Microsoft Corp.'s MS-Net and Apple Computer, Inc.'s AppleTalk. LANStar's basic equipment includes an interface card that fits into an expansion slot on the personal computer and a packet transport cabinet. The latter handles user interfacing, packet assembly, packet switching and network management.

LANStar has been optimized to run with VINES. A VINES software shell runs with DOS in every workstation and redirects DOS requests to and from the interface card.

Another interface card is placed in the VINES server to link it with the personal computer.

Northern Telecom offers an interface card for the Macintosh II, and software that marries the AppleTalk network protocol to the LANStar hardware. When an application makes a request to the network, the LANStar AppleTalk software tells it to look for the LANStar interface card instead of the printer port that AppleTalk uses.

The personal computer interface card works with IBM Personal Computer XT and AT models and plugs into the direct memory access channel. The Apple interface card plugs into a Macintosh II NuBus slot. Data transmission speed is 2.56M bit/sec for both personal computer families, vs. 19.2K bit/sec for ISN.

LANStar uses the same type of wire as ISN to link to the packet transport. Unlike ISN, which uses a concentrator handling up to five terminals, each LANStar connection needs a separate wire. Since LANStar is available in versions that accommodate 32, 112, 256, 1,024 and 1,344 devices, that could add up to a lot of cable.

Each personal computer interface card has two RJ-11 telephone jacks: one for a telephone and the other for connecting the card to the twisted-pair backbone. By connecting the telephone to the card, LANStar obviates the need for two separate wall connections. Each node needs three twisted pairs, one for the telephone and two for the data transfer. Data and voice travel to the wire closet, where data splits off and goes to the packet transport cabinet and voice goes to the PBX.

The data terminates at a Lanlink assembly card set in the packet transport. Each card set supports 16 connections. The packet transporter determines the end point address, routes data over its internal 40M bit/sec transport bus and transmits it to the end point through a dedicated connection. Each personal computer can be 2,000 feet from the packet transport cabinet.

In contrast, ISN supports distances of only 1,000-, 600- and 300 feet for 4.8K-, 9.6K- and 19.2K bit/sec asynchronous data, respectively. Those distances, however, can be increased to 6,000 (4.8K bit/sec) and 2,000 (19.2K bit/sec) feet through optional modules that act as repeaters or amplifiers. The normal synchronous data transmission distance is just 50 feet, but that can be increased to 16,500 or 9,900 feet for 9.6K and 19.2K bit/sec, respectively.

LANStar lacks ISN's capability of directly connecting asynchronous, synchronous and IBM 3270 terminals to host processors. That can be accomplished by using a Meridian SL-1 PBX or a Banyan server as an intermediary.

User comment

A big LANStar installation is at the University of Michigan in Ann Arbor, which has seven systems installed. According to Steve Robinovitz, a telecommunications specialist at the University of Michigan in Ann Arbor, the LANStar is used principally to permit 250 to 300 users to share data bases running on a Banyan server. The university chose LANStar over token-passing and 1M bit/sec local networks. "The Ethernet couldn't handle the traffic volume and would have required too many bridged systems, while the token ring needed twisted-pair wiring. The [LANStar] system allowed us to use existing facilities," he states.

Steve Good at the Rochester Institute of Technology (RIT) in Rochester, N.Y., is an ISN user. Good, a network administrator, says the RIT network comprises asynchronous terminals (DEC and IBM), personal computers (DEC, IBM and Apple), and a variety of IBM and DEC hosts.

According to Good, RIT's personal computers perform file transfers using the Kermit protocol; he's heard no complaints about the 19.2K bit/sec transmission speed. He also states that the 7.2K bit/sec used for IBM's BSC has been satisfactory. He does have two gripes, however.

"When a called resource is busy, users can't be queued to it. They have to disconnect and try later," he says. His other complaint concerns ISN's inability to disconnect a line with no data activity, "leaving users connected even though they're not doing any processing," he states.

Summary

Both products can network a wide variety of devices, but with different techniques. With ISN, users buy interface modules for the desired terminals and plug them into the concentrator. LANStar accommodates the same devices as ISN, but needs an SL-1

(continued on page 52)

Hunter is president of TMS Corp., a telecommunications consulting firm in Devon, Pa.

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